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JAMES WALTER LONG, M.D., Medical Director for Gulf Oil at Port Arthur, Texas, became Medical Director for the entire Gulf Oil Corporation, as of January 1, 1952, with headquarters at Pittsburgh. Following its announcement of this move, *The Port Arthur News* for November 29, 1951, continues: "A former mayor and city commissioner here, DR. LONG is a veteran of World Wars I and II and holds membership in numerous professional and civic organizations. He came to Port Arthur in 1929 to serve as pathologist of Mary Gates hospital, whose building later became the city hall, to which he returned as city commissioner and mayor. After a few months at Gates, he practiced at Gadsden, Alabama, and Del Rio. It was while he was in Del Rio that he was asked to join the Gulf refinery. He took the job July 1, 1930. As an army reservist, he was called to active duty as a First Lieutenant, May 20, 1941, and was released five years later with the rank of Lieutenant Colonel. He spent 42 months in the Pacific theater and won a Bronze Star medal on Iwo Jima. He became commanding officer of the 342nd Medical battalion, Organized Reserve Corps, in 1947. During World War I he was a private in the infantry.... In June, 1946, DR. LONG was appointed to the city commission to fill an unexpired term. He was then elected to two consecutive terms of his own, and was mayor for two years. He did

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not seek re-election when his second term ended last April. DR. LONG, now 51, was born in Belton, South Carolina, and reared in Liberty, South Carolina. He received a B.A. at Furman University in 1919. After teaching school a year, he completed a premedical course at Emory University, and studied medicine at Jefferson Medical College and Tulane, where he received his medical degree in 1926. He is past-president of the St. Mary's hospital staff (and Honorary Life Member), and of the Jefferson County Medical Society. He holds membership in the Texas State Medical Association, in addition to a number of important regional and national societies. From 1938 to 1941 he was Chairman of the Health Committee, Petroleum Section, National Safety Council. This year (July 1, 1951) he was appointed to the State Board of Health. As Gulf medical and health supervisor, his duties extended to the Gulf Refineries in Fort Worth and elsewhere in Texas . . . . "

An editorial in *The Port Arthur News* for December 18, 1951, said: "Fellow Gulf Oil employees of DR. JAMES W. LONG, his comrads of the American Legion and Veterans of Foreign Wars, and his past and present associates in a wide range of civic endeavors will join Wednesday night in bidding the Doctor a fond farewell. It's Port Arthur's loss and Pittsburgh's gain, but DR. LONG is leaving us to take a big new job at Gulf's headquarters in the latter city . . . . Affectionately known as 'Jimmy' to hundreds and as 'Doc' to thousands, his beaming, friendly figure will be widely missed. He's come to be sort of an institution out at the refinery—and around town, too. DR. LONG himself couldn't begin to list all the community endeavors with which he has been connected here in the last 15 years. Reflecting the esteem in which he has been held are the responsible offices he has been called on to fill—that of mayor, for instance, and as commander of what was then the biggest American Legion post in Texas. He has served his church and the Chamber of Commerce and the Lions Club and the YMCA and the Community Chest and no end of other agencies whose aim is to make Port Arthur a more pleas-

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ant city. Several hundred will doubtless be on hand for the send-off which his closer friends and acquaintances are putting on in his honor. But they'll represent only a small fraction of the number of Port Arthurans who have a warm spot in their heart for 'DOC' LONG...." On Wednesday, December 20, the *News* said again: "DR. JAMES W. LONG was honored last night at a farewell party attended by more than 200 of his fellow Gulf employees, his comrades of the Legion and the V.F.W., representatives of the city, and of the medical profession, county and state officials, Chamber of Commerce spokesmen, members of organized labor, businessmen, and just plain friends. . . . One of the most signficant speeches of the evening was by J. HERBERT JACKSON, President of Local 23 of the Oil Workers' international union, who credited DR. LONG 'with doing more to create and promote goodwill at the Gulf refinery than any other individual.'" A proclamation by the mayor had made Wednesday, December 19, "James Long Day" in Port Arthur. DR. LONG has been a member of INDUSTRIAL MEDICAL ASSOCIATION since 1933; a Fellow, since 1938.

Recent Deaths

THOMAS LUTHER WILSON, M.D., 79, at Pittsburgh, January 14, 1952. DR. WILSON was born in November, 1873, on a farm near Grafton, West Virginia. He graduated at Maryland Medical College, Baltimore, in 1903, and established his practice at Piedmont, West Virginia, where he continued until 1926, when he

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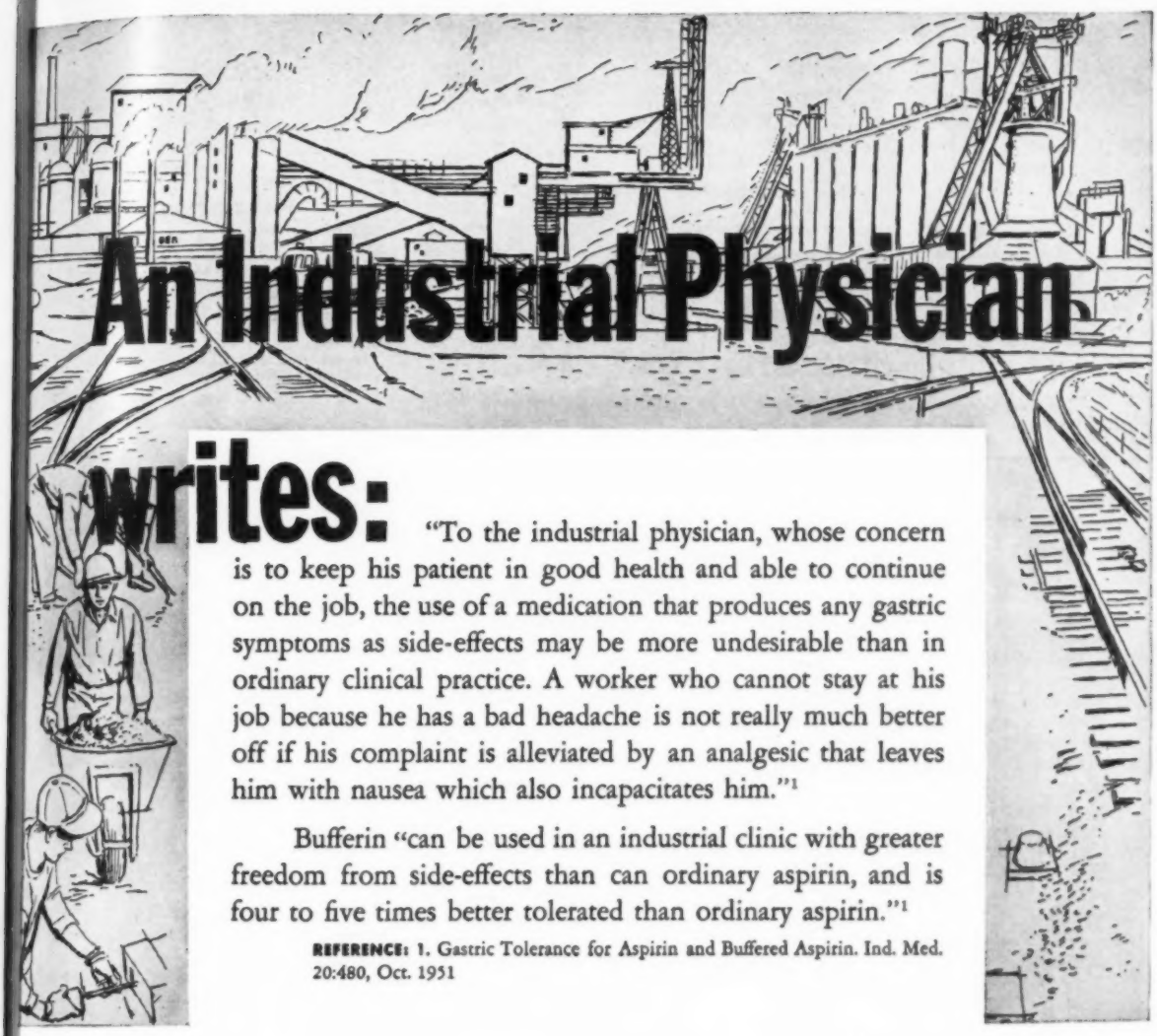

An Industrial Physician writes:

"To the industrial physician, whose concern is to keep his patient in good health and able to continue on the job, the use of a medication that produces any gastric symptoms as side-effects may be more undesirable than in ordinary clinical practice. A worker who cannot stay at his job because he has a bad headache is not really much better off if his complaint is alleviated by an analgesic that leaves him with nausea which also incapacitates him."[1]

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REFERENCE: 1. Gastric Tolerance for Aspirin and Buffered Aspirin. Ind. Med. 20:480, Oct. 1951

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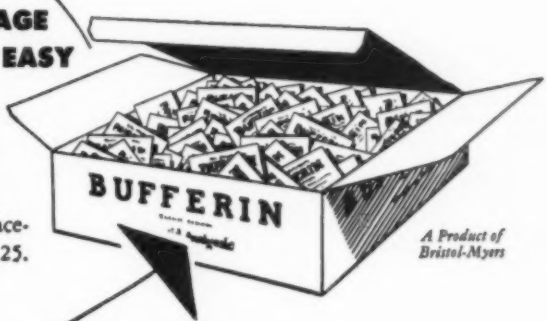

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moved to Pittsburgh. In 1919 and 1920 he took post-graduate work at Johns Hopkins. He was a member of the AMERICAN ASSOCIATION OF RAILWAY SURGEONS.

MARSHALL ABNER MOORE, M.D., 62, at Montgomery, West Virginia, October 29, 1951. DR. MOORE was born in Lexington, Virginia, in 1889, and was graduated M.D. at Medical College of Virginia in 1915. He was a First Lieutenant, M.C., U.S.A., 1917-19, and since 1921 had been industrial physician and surgeon for coal company subsidiaries of Allied Chemical & Dye Corporation.

JAMES STEWART NIBLICK, M.D., 56, at East Chicago, Indiana, December 26, 1951. DR. NIBLICK was born at Decatur, Indiana, in 1895, graduated M.D. at Loyola University in 1916, interned at South Chicago Hospital, 1916-17, and had been 34 years in industrial medical work for numerous manufacturing and transportation companies in the Gary-Hammond area.

THIS MONTH

THE EXOTIC woods described by DR. DANTIN-GALLEGO, DR. ARMAYOR and MISS RIESCO (page 41), and the "mass hysteria almost to the point of a true collective psychosis" which accompanied their initial sawing and working just *might* have been a "first" in this country rather than in Spain. The woods will undoubtedly make appearance here; the "hysteria," as well as its causes, having been so excellently described, will be forefended .... PROFESSOR KEMP, in his "Role of Nurses in Industry" (page 62), uses a pungent and provocative phrase: "the pension-and-pittance level of professional and intellectual mediocrity." That, whether they admit or deny, is the level at which the would-be "political hygienists" (page 46), swelling in their places of power, are aiming to hold us. The February 29 quote in the ALMANAC (page 14) emphasizes (via its "Leap Year" date) that this is another of the years in which the horde of them will seek reelection—each "wiser in his own conceit than seven men that can render a reason".... THE Work Classification Unit described in the "Cardiac" Symposium (page 75) furnished the data for a study, by LEONARD J. GOLDWATER, of 175 "cardiacs without heart disease" (in *J.A.-M.A.*, January 12, 1952). Interesting are the figures as to the original "erroneous diagnoses": 19 of them were made at hospital clinics; 17 by school physicians; 51 in the Armed Forces; 57 by private physicians; 12 by insurance and industrial physicians .... FR. ENRIGHT, in his "Revaluation of Man" (page 82), reminds us: "We are learning that the whole man comes to work, man with his disappointments, misgivings, antipathies, ambitions, sorrows, worries. All of these were hired by the unsuspecting employer along with the muscles of the man's arms and the brains of his head." But against the current trend toward emphasizing the intangibles, we are also reminded (page 98) that "Man will be sadly misled if he decides that he can successfully and healthily ignore what he has naively thought of as his physical structure." There is deep, deep meaning in the quote from Gertrude Stein: "A man is a man is a man is a man." (Incidentally, we've always heard it is a rose that is "a rose is a rose is a rose." There is some doubt that it can be both! This thought, in turn, is one more reminder—of the old story of the teacher who sent the small boy home with a note that he needed a bath. Quickly came the irate answer: "Willie ain't no rose. Don't smell 'im—learn 'im!") .... NEW ENGLAND JOURNAL OF MEDICINE has a "personality," distinctive, scholarly, agreeable. Its editorials are always good, often better, sometimes superlative. Deservedly, they are quotable. And we like to quote them (pages 81, 98) .... AND, speaking of medical journals, we are much impressed by the increasing excellence of the *British Journal of Industrial Medicine* .... DR. KAMMER (pages 86-89) gives us a "behind-the-scenes" glimpse of the Cincinnati Conference preparations, and the Officers and Committee Chairman who are so earnestly and capably carrying them forward. As Ed Sullivan says, on his Sunday evening "Toast of the Town," "A big hand for all of them" .... BERT HANMAN'S new book "Physical Capacities and Job Placement," (reviewed by CLARK D. BRIDGES, page 90), in addition to its merits as an important contribution to the science of his subject, is a joy to read. It is a gem of clear thinking, in a setting of the kind of words and the manner of using them that characterize really good writing. BERT knows his subject with the thoroughness of many years of living with it, and he explains it so well, and with so much of the simplicity of complete mastery, that the reader will have no difficulty in knowing it too .... THE circumstances of DR. JAMES W. LONG'S "promotion" from Port Arthur, Texas, to Pittsburgh, as told in the local papers (see pages 6-10) completely belie the adage that "a prophet is not without honor save in his own country." DR. LONG'S many honors were richly deserved—doubly so in that they came at the end of more than 20 deserving years .... THE editorial, "Stones of Memory" (page 100) points up the fact that DR. LEGGE'S ALMANAC will, increasingly as the months roll past, identify the "life spans begun and ended" of industrial medicine's distinguished men. Thinking of those who are gone —SAPPINGTON, HARVEY, LOWE, BROOKS, ROY GARDNER, STORY, CROWDER, SCHRAM, WITTMER, SHOUDY, and many others—inspired the reprinting (on page 64) of an editorial which appeared in this Journal 15 years ago this month.... A LAST-MINUTE news item is to the effect that, on March 1, 1952, DR. DANIEL C. BRAUN, Medical Director, Pittsburgh Coal Company, since 1938, will join DR. C. RICHARD WALMER on the medical staff of the Industrial Hygiene Foundation, Mellon Institute, Pittsburgh .... NOISE—lots of it—is being made in industrial medical circles about "Noise." It is, currently, one of the pressing subjects of scientific and medical study. Following the *really big noise about noise*—the four-day Lecture Course on "Noise—Wanted and Unwanted" at University of Michigan School of Public Health, February 5-8, 1952—this Journal will feature "The Acoustical Spectrum" in its April issue....

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MEDICAMENTA VERA

Industrial Medical and Related Chronology selected and arranged by ROBERT T. LEGGE, M.D., F.A.C.S., Berkeley, California

"Little man, what makes you satisfied
With your little toys of life, when all about
Is the majesty of spirit?
Pause, oh man!
The silences are full of mighty music!
Pause—
While you can hear it...."

♒ = Aquarius — January 22-February 19 ‖ ♓ = Pisces — February 20-March 20

1952 FEBRUARY

FEBRUARY is the month of excuses. It's too cold, too wet, too snowy, too blowy.... An almost balmy day—then sudden frigid proof that Winter reigns. FEBRUARY was put into the calendar by Numa Pompilius, legendary king of Rome (B.C. 715-672). He made it the last of the twelve months. In B.C. 452 the Decemvirs placed it where it is. The Anglo-Saxons called it "Sprout-Kale." Candlemas falls on the second. The ground hog's repute as a weather prophet is an American variation of the tradition that a sunny Candlemas presages a cold Spring. An old Scottish saying had it thus: "If Candlemas is fair and clear, there'll be two Winters in the year." "Stern Winter loves a dirge-like sound"—but Nature's only sleeping....

☽ 1st Quar. ○ Full Moon ☾ 4th Quar. ● New Moon

1 ♒ Fr

1921—The National Leprosarium, U.S. Public Health Service, opened at Carville, Louisiana.
"I never could believe that Providence had sent a few men into the world ready booted and spurred to ride, and millions ready saddled and bridled to be ridden."—Rumbold.

2 ☽ Sa

1884—Robert Koch (1843-1910), distinguished German pathologist, from the banks of the Ganges chronicled his discovery of the cholera germ.
1952—Candlemas Day: the ground hog emerges to see if winter is over.

3 ♒ S

1821—Elizabeth Blackwell (1821-1910), first woman in the United States to receive a medical degree, born in Bristol, England.
"In my experience it is not work but painful thinking and painful emotion that weary us."—W. Alvarez.

4 ♒ M

1939—California Physicians' Service established, with Ray Lyman Wilbur President.
"The desire to take medicine is perhaps the greatest feature which distinguishes man from animals."—Sir William Osler (1849-1919).

5 ♒ Tu

1872—Lafayette B. Mendel, discoverer of Vitamin A and the function of Vitamin C, born at Delhi, New York.
1952—"The Acoustical Spectrum: Sound—Wanted and Unwanted," lecture course at University of Michigan School of Public Health.

6 ♒ W

1845—Nathan Smith Davis, M.D., organized the American Medical Association.
"The ultimate result of shielding men from the effects of folly is to fill the world with fools."—Herbert Spencer (1820-1903).

7 ♒ Th

1835—Baron Guillaume Dupuytren, 58, Professor of Surgery, Hotel Dieu, Paris, died. His name was attached to the contracture of the palmar fascia, and to his splint to prevent eversion in Potts' fracture.
"Every man of us has all the centuries in him."

8 ♒ Fr

1890—Richard J. E. Frommel (1854-1912), German gynecologist, developed an operation for retroflexion of the uterus.
"Extreme remedies are very appropriate for extreme diseases."—Hippocrates (B.C. 460-359).

9 ♒ Sa

1871—Howard Taylor Ricketts born at Findlay, Ohio. Discovered that Rocky Mountain spotted fever is conveyed to man by an infected tick.
"Words are the physicians of a mind diseased."—Aeschylus (B.C. 525-456).

10 ○ S

1922—Wilhelm Conrad Roentgen, discoverer of the x-ray, died.
1912—Joseph Lister, "Father of Antiseptic Surgery, first M.D. to be elevated to the peerage, died at 85.
"Another cold spell."—Old Farmer's Almanac.

11 ♒ M

1650—René Descartes, 54, French philosopher and scientist, died at Stockholm.
"It is the soundness of the bones that ultimates itself in the peach-bloom complexion."—Ralph Waldo Emerson (1803-1882).

12 ♒ Tu

1809—Charles Robert Darwin, author of "The Origin of Species," born at Shrewsbury, England. Died, 1882, at Down, Kent.
1809—Abraham Lincoln born at Larue, Kentucky.
"When in doubt, win' the trick."—Hoyle.

13 ♒ W

1843—Oliver Wendell Holmes, M.D. (1809-1894), read his epoch-making essay on "The Contagiousness of Puerperal Fever."
"Tomorrow is Saint Valentine's day, all in the morning betime."—Shakespeare (1564-1618).

14 ♒ Th

1728—John Hunter born at Lanarkshire, Scotland. Staff Surgeon, St. George's; founder of the Hunterian Museum; anatomist of distinction; described the olfactory nerve to its terminal distribution; devised a method of ligation in aneurysm. Died, 1793.

15 ♒ Fr

1830—Silas Weir Mitchell, physician and novelist, born at Philadelphia. Died, 1914.
1893—Congress established a national quarantine, vesting the powers in the U.S.P.H.S.
"Now comes a real blizzard."—Old Farmer's Almanac.

16 ♒ Sa

1754—Richard Mead, distinguished physician, graduate of Padua, discoverer of the itch mite, court physician to George II, died at London.
"Wherever the art of medicine is loved, there also is a love for humanity."—Hippocrates (B.C. 460-359).

17 ♒ S

1866—William Farr, English authority in vital statistics, published in the *Daily News*, his Farr Law.
1781—René Théophile Laënnec, French physician, inventor of the stethoscope, and discoverer of auscultation, born in Brittany.

18 ☾ M

1933—E. A. von Willebrand, physician of Helsenfors, reported a new disease, constitutional thrombopathy.
"The best physician is he who knows well how to decide where and when to be accurate, where and when to get along without accuracy."—R. Cabot.

19 ♒ Tu

"Drinking water neither makes a man sick, nor in debt, nor his wife a widow."—John Neal.
"The great Russian surgeon of the past century, Pirogoff, defined war as an 'epidemic of trauma.'"—(New England Med. J.).

20 ♓ W

1802—Thomas Percival, Manchester physician, published his masterpiece, "Medical Ethics."
1820—Louis Albert Sayre born at Madison, New Jersey. Held first professorship in orthopedics; first to remove the head of a femur.

21 ♓ Th

1610—Jeremias Trautmann, at Wittenburg, Germany, performed the first Caesarian operation to be historically established on a living woman.
"Full wise is he that can himselven knowe."—Chaucer (1328-1400).

22 ♓ Fr

1732—George Washington born in Westmoreland County, Virginia.
1896—Joseph Babinski, Chief, Charcot's clinic at Salpetriere, described the cardinal sign in neurological semeiology which bears his name.

23 ♓ Sa

1924—Robert Grigg Reese (1866-1926), a New York ophthalmologist, announced his technique for iridectomy and glaucoma.
"Dictators always look good until the last ten minutes."—Jan Masaryk.

24 ♓ S

1898—Anton Krokiewicz, a Krakow physician, developed a test for bile pigments in urine.
"What the government gives you the government can take away, and once it starts taking away, it can take more than it gave."—Samuel Gompers (1850-1924).

25 ● M

1950—George Richard Minot, Nobel Prize winner for his work in connection with liver treatment for anemias, died at Boston.
"For ways that are dark and for tricks that are vain, the heathen Chinee is peculiar."—Bret Harte (1839-1902).

26 ♓ Tu

"It is a condition which confronts us—not a theory."—Grover Cleveland (1837-1908).
"Fed up on marvels, a chemist friend claims to have developed the real wonder drug. Doesn't cure anything."—(Denver Post).

27 ♓ W

1886—Henry Hugh Clutten (1850-1909), a London surgeon, observed symmetrical synovitis of the knee to be hereditary.
"Absence of occupation is not rest; a mind quite vacant is a mind distress'd."—William Cowper (1731-1800).
"Cloudy and rowdy."—Old Farmer's Almanac.

28 ♓ Th

1891—Rudolph Chrobak (1843-1910), a German gynecologist, devised an operation for abdominal hysterectomy.
"We all have something to fall back on, and I never knew a phony who didn't land on it eventually."—Wilson Mizner.

29 ♓ Fr

1952—"Late February days; and now, at last, might you have thought that Winter's woe was past, so fair the sky was, and so soft the air."
"Wiser in his own conceit than seven men that can render a reason."—Proverbs 26:16.

GOD give us men. The time demands
Strong minds, great hearts, true faith, and willing hands;
Men whom the lust of office does not kill;
Men whom the spoils of office cannot buy;
Men who possess opinions and a will;
Men who have honor; men who will not lie;
Men who can stand before a demagogue
And damn his treacherous flatteries without winking;
Tall men, sun-crowned, who live above the fog
In public duty and in private thinking."
—J. G. Holland (1819-1881).

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INDUSTRIAL MEDICINE AND SURGERY
The Journal of Medicine in Industry
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Some New Toxic Woods : Some New Manifestations of Toxicity

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DURING May, 1947, several workers from the carpentry mill of a railway system went to the polyclinic of the "Health Insurance," attended by one of us, complaining of a series of disturbances which they attributed, at that time, to the beginning of the sawing and working of a large wood shipment coming from Spanish Guinea, on the west coast of Africa, under the Equator. This shipment contained several wood types not well identified but which the workmen generally named "Caobillas de Guinea." In general these several woods were similar to mahogany. The initial onset was severe and sudden, involving a great number of workers who mainly were sawers, carvers, etc.

The total of five cases fully observed presented in common the presence of an allergy similar to that found in hay-fever, with some catarrhal manifestations of the upper respiratory tract, nose and throat itching, coughing, fever, general malaise and hemoptysis—this last sign being the most alarming for the patients.

In view of the importance of the fact that there arose a mass hysteria almost to the point of a true collective psychosis contrasting with the relatively minor allergic phenomena, we directed ourselves to a complete study, thus anticipating a report to the Instituto Nacional de Medicina del Trabajo asking for necessary help from the President of the Safety and Hygiene Committee of that enterprise in order to support the necessary research.

Case Reports

IMMEDIATELY following are briefed clinic histories of the five cases observed:

CASE 1: F.E.B.; married; 36 years old. Father died of pulmonary tuberculosis. Mother healthy. In sawing "Ukola" logs he experienced throat burning; he spat some blood and his eyes were reddish.

Inspection: Catarrhal conjunctivitis. Pharyngitis.

Heart Auscultation: Functional systolic murmur.

Dermographism: Positive.

Blood Count: WBC 8,200; Eosin. 3; PMN 70; Lymph. 28.

Treatment: Germinol. Metholated alcohol inhalations.

CASE 2: J.M.P.G.; married; 51 years old. As a child he suffered from ganglia and intestinal infections. He has suffered from colds and has had treatments with some calcium injections, ordered by a doctor of a dispensary.

In sawing Guinea woods, he observed that his colds were worse, and he was in bed two days with fever, malaise, cough and vomited blood. When he went to the clinic, he had 38° (C) fever, hemoptic expectoration and cough.

Lungs: Shadow zone in right lung vertex. Bronchial blow in the same zone. Humid stertors with fine rales. Ronchi and sibilances.

Radioscopically: Productive pulmonary tuberculosis of right vertex with recent perifocal reaction.

Blood Count: WBC 7,800; Eosin. 2; Lymph. 42; M-1.

Diagnosis: Apical active tuberculosis.

CASE 3: J.P.P.A.; married; 50 years old. He often has experienced colitis, colds and nasal obstruction. Some days ago he experienced increasing intestinal pains and diarrhea.

Along with the rest of his companions in the mill when they began to work the Guinea wood, he noticed strong itching in the hands, nose itching, sternutation and cough, produced (according to his opinion) by the dryness of his throat. On coughing he noted some spots of blood in the nasal secretion. Malaise.

Inspection: Intense dermographism. Temperature of 38.1° C.

Lungs: Ronchi and sibilances in right hemithorax, especially in posterior plane.

Skin Inspection: Reactivated dry eczematous dermatitis.

Diagnosis: Allergic laryngopharyngitis. Dermatitis.

Treatment: He was sent to a skin specialist

This report, with some modifications, was presented at the Tenth International Congress on Industrial Medicine, Lisbon, Portugal, September, 1951.

who prescribed "Merck" ephetonine, germinol; and common camomile inhalations.

CASE 4: F.G.R.; not married; 31 years old. He has frequent colds, worse in the spring. On sawing the Guinea wood in the mill where he works as a helper in carpentry, he experienced severe itching of the nose, dry throat and increasing cough. Great thoracic oppression. In the nasal exudate he noted blood spots.

Inspection: Redness of the nasal and pharyngeal mucosa.

Lungs: Small ronchi and sibilances. Rough breathing in left apex.

Circulatory Apparatus Auscultation: Slight increase of second pulmonary tone.

Dermographism: Positive. Temperature 37.2° C.

Diagnosis: Bronchitis with asthmatic attacks recently reactivated. Acute rhinitis and pharyngitis.

Blood Count: WBC 7,500; Eosin. 7; PMN 50; Lymph. 30; M-8.

He improved with the treatment of Fedrial, Yodasmol and, over all, with the suspension of the sawing of the Guinea woods.

CASE 5: D.M.S.; married; 57 years old. He has frequent colds, which are severer in winter, and has to have balsamic injections.

On sawing the Guinea woods, he noted an increase in coughing and expectorating, and his nose secreted a great quantity of a liquid exudate, blood-spotted.

Strong itching in the throat. Dyspnea.

Inspection: Congestive rinopharyngitis.

Lungs: Bronchitis.

Diagnosis: Bronchitis. Allergy.

Treatment: Rinotiazol in nasal instillations.

The fact that most of the other workers in the mills showed analogous symptoms to those described, led to work suspension indefinitely, preventing the study of a greater number of cases.

On making a summary of the clinic facts, we observed that the symptoms found were of three types:

1. Lesions on the skin (Case 3).
2. Catarrhal reactions on the mucosas (Cases 1, 2, 3, 4 and 5) especially in the upper respiratory tract.
3. General phenomena (Cases 2, 3 and 4).

The dermatologic alteration may appear suddenly after first contact with dust, or as a reactivation. Its principal site is on the uncovered parts of the body, and it changes from a simple erythema to most complex anatomic lesions.

The mucosal lesions consist of conjunctivitis, rhinitis and all kinds of catarrhal disturbances of the upper respiratory tract. Certain African species produced difficult breathing, air hunger, bronchitis, and asthma.

Other phenomena consist of asthenia, several algae, fever sometimes high, neuro-vegetative alterations, etc.

Other authors' opinions in relation to the pathology of these processes are divided into two fundamental groups: some of them believe that they are a chemical irritant action; others think they may be identified with some mechanisms of allergic sensitization.

We do not intend to study deeply the question here, but to provide only a summary of the problem in our country and the investigations carried on by some of us.

The Problem

WE FIRST presented our observations in a clinic meeting of the "Instituto de Medicina del Trabajo." Dr. Lahoz contributed a lecture on the "Professionelle Allergia." Dr. Diaz Carmena also spoke at the same meeting, making mention of observations in relation to disturbances due to the woods, but without collected statistics.

Later, Professor Dr. Pinerua collected several more cases deriving from some important carpentry mills in Madrid (Iglesias, Padilla 68) which also were showed to the Institute. As common symptomatology he found: nasal hemorrhages, hemoptic spit, dyspnea, fever and abdominal pains—data which all were in agreement with our observations.

Afterward we found some mild cases which appeared in distant mills: "Gallart," "Loscertales," "Larrea," etc., which led us to begin an inquiry which actually is in preparation, and the data are plentiful. We hope thus to put into movement a series of systematic researches which will develop a great casuistry of nation-wide character, evidently necessary to provide definite conclusions for the medical and preventive problem.

At the same time, we began a series of investigations in order to obtain technical information especially related to the nature of the woods, collecting data from the Sindicato Nacional de la Madera and from the Health Services of the Spanish Territories of Guinea. We also sought the help of several centers and laboratories of the State, especially the Botanical Garden and the Forestry Institute. We note here the worthy support of the mycologist, Dr. Jordan de Urrieres, and of the parasitologist, Dr. Najera Angulo.

Finally were begun chemical analyses of wood samples, with results appearing later in detail and which justify some exact conclusions.

Technologic Aspects

WE NOW confine ourselves to the technology of the woods from Spanish Guinea which are more frequently imported into the peninsula. The most employed species are:

Ecue (Eugomo en pamue), Coula edulis Benth, of the olaceous.

Ukola (pamue), Ukorro (bubi), identifiable with the African Dumeria Chev, of the sapotaceous.

Samanguila (pamue), Knaya Klainei Pierv., of the meliaceous.

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Landing place, in Pasajes Bay de San Juan (Guipuzcoa).

Logs from Spanish Guinea at the mills at Pasajes de San Juan.

Mahagoni, Khaya senegalensis, idem.

Oven (pamue), identifiable with the African Afzelia.

Others are known to Spanish workers (Cicuspida, Sucupira, etc.), but are difficult to identify. Commonly, all are designated "caobillas de Guinea" because of characteristics similar to those of the mahogany wood from the West Indies and employed in luxury carpentry.

According to the German work "Pflanzen-Leben," III, the west coast of tropical Africa is three times richer in botanical products than the east, and richer as to variety. The tropical trees are often attacked by fungi which actively participate in the natural decomposition of the wood debris, apart from the participation of many other micro-organisms. Schellenberg has made complete studies of these processes, and it is interesting to refer to Thaysen and Bunker's works on "Microbiology of the Celulosae," and "Hemiceclulosae and Pectins."

This parasitism, which sometimes appears late, varies according to the circumstances of transportation and storing of the logs which remain, many times, in rivers and bays at temperatures sometimes favorable to the development of the mentioned micro-organisms. It could be that the appearance of those signs regarded as indicative of allergy are to be attributed to fungal organisms, being thus the origin of the phenomena instead of the vegetable matter.

According to data furnished by Jaime Nosti, an agricultural engineer who knows the Guinea country well, locally the toxic effects of the dust of the woods are unknown. This is possibly explained by the fact that locally there is little cutting of timber with ensuing exposure to air. Sawing is chiefly limited to the cutting of logs 10 to 20 meters long. The only sawmill in Guinea is at Alena de Etembue, but there are several cabinet shops in the Isla where they fabricate the woods of the white mulberry tree, bocapi, sapeli, etc., without known significant impairment of health.

Noteworthy is Dr. Carlos Garcia Lorenzana's statement. Dr. Lorenzana (from the Special Medical Service of Spanish Guinea) is in Rio Benito (Continental Guinea) and is chief physician for the wood industry (Aggor, S.A.—Izaguirre and C.—A.L.E.N.A., Jover and Graells-Aroz, etc.). He reports that in the consultation work of the hospital for these enterprises, he personally saw more than 50 to 60 Negroes among those who work in the woods, but never observed the pharyngitis, asthma, etc., which are found in the peninsula.

The operation is limited to the "falling" of the trees, and, when this is done, sawing them by hand into logs, and transporting them by streams, trains or tractors to the ships.

The importance of the industry is seen by the following data:

Wood area: 25,000 square kilometers.

Actual importation: 75,000 tons per year. Next year 200,000 tons may be obtained by new concessions for operations.

Transportation: 45 ships, and 280 trains for the conveyance from the ports to the interior factories.

From such figures may be understood the role played in the national economy by the woods with which we are dealing, and the necessity for furnishing adequate preventive measures.

In the peninsula, most of the woods are imported by the Pasajes port (Bilbao) through Valencia, Barcelona, etc. The most important factories are: Sama in Bilbao, Acha in Pasajes, Marga in Santander, Lyus Real in La Coruna, Jover in Barcelona, and Nonvela in Madrid. We also may include the R.E.N.F.E. mills in the capital.

At these mills the major operations are somewhat as follows: The logs are debarked and cut into shorter lengths. Thereafter rough sawing takes place, leading eventually to small square boards. These then go through the planing mills. Such operations lead to a variety of shapes, sizes and lengths, all of which boards and pieces are further smoothed and polished. It is in such work that our patients, and other afflicted, engaged. What is the reason for their symptoms?

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Etiologic Possibilities

IN RELATION to etiology, we must consider the following factors:

(A) Physical Properties of the Woods.
(B) Physical Properties of the Wood Dust.
(C) Chemical Derivatives from the Woods.
(D) Climate and Work Conditions.
(E) Parasites and Vegetable Allergens.
(F) Personality and Constitution of the Worker.

A. PHYSICAL PROPERTIES OF THE WOODS. The species we are dealing with are extraordinarily hard, except those treated for unrolling by a method similar to that of the "enriado" of the textile fibers (disintegration of the vegetable structures for the easy separation of the fibers). Not yet can we determine the degree of hardness but, according to those who manipulate these woods, "they bend the tool." At any rate, there is a formation of fine needles which readily wound the mucosa. The age of the wood influences the degree of hardness—i.e., the time since it was cut, its degree of dryness or dehydration, etc.

B. PHYSICAL PROPERTIES OF THE WOOD DUST. This is influenced by the hardness of the wood and the characteristics of the tools or machines employed in distinct operations. The smaller the teeth of the saw and the greater the speed of the wheel, the finer will be the dust. These circumstances are more evident in the last phases of wood finishing. This theory is confirmed by the clinic.

Sehman has demonstrated that the wood particles in the operations of sawing and brushing can reach 10 micras. Kovats, from Budapest, in his study of toxoricosis (a disease in which are mixed the mechanical lesions and mycosis of the respiratory tract and mesenchyma) states that the greatest size of a spore which can penetrate the pulmonary alveoli is not more than five micras. Naturally, he refers to the spherical form, and it is understood that the count is not exact in the fusiforms and others.

C. CHEMICAL DERIVATIVES FROM THE WOODS. This is one of the more studied and one of the richest aspects of the problem. Detailed analyses would lead us to the study of the vegetable chemicals, including the cellulose, hemicellulose, pectins, rubbers, resins, alkaloids, and glucosides. This is not our objective and we refer the reader to some of the several works existing on the matter.

The species mentioned are numerous and almost always exotic. They include wide varieties and almost always have, among the workers, local names, a situation which contributes a mysterious character to the observed disturbances. In recent statistics collected by American authors the number of "Toxic Woods" is elevated to 122 species.

Among toxic agents described are: alkaloids, rubber-resins, stearins, volatile substances, etc. Gibson and Dixon, of Cambridge, prepared an alkaloid from the "gonioma kamasi" similar to the curare; Auld obtained an active agent which he named "chloroxitoxine"; Mattehs and Schreiber also isolated another alkaloid which they termed "flindersin" in which the skin irritant action is attributed to the accompanying unsaturated resinic acids. An official report in England in 1907 (John Hay) first called attention to the appearance of respiratory phenomena from wood work on the African species; the same view was held by Brun and Ragot after investigation of one African species (the Irokoto or African evergreen-oak) showing the prominence of the respiratory signs, being the first to extract the various fractions and in conducting experimental studies with volunteers.

The chemical changes that take place within the vegetable matter of woods are varied, several, and little studied. Notwithstanding, we are disposed to believe that therein is the explanation why the same wood that significantly induced no disturbances among the workers at the sites of its origin, is so toxic and active in the last operations that take place in the mills long after log cutting. In addition to elapsed time, there occur variations in humidity, temperature, exposure to micro-organisms, etc. In our subsequent chemical section, we believe that our data will support this statement. There it will be recorded that we detected highly toxic saponines, certain glucosides which after hydrolysis in alkaline media in the presence of heat are decomposed into saponines.

The toxic properties of the saponines will be considered in that section of this report dealing with pathology.

D. CLIMATE AND WORK CONDITIONS. We believe that due consideration must be extended to the climate of the region where the factories are located and the type of structure of the buildings for each mill. The degree of humidity, the environmental temperature, the location of the mill, the type of ventilation, the season of the year, all may be important in the formation of harmful chemical agents and the propagation of parasitic organisms. Such considerations undoubtedly have contributed to the divergent observations recorded by different authors.

E. PARASITES AND VEGETABLE ALLERGENS. Prior to 1935, Erich Urbach, in reviewing the allergies produced by woods and plants, noted the possibility that the manifestations of sensitization as detected might be due not to the wood per se, but to the fungi or parasites it might contain.

We do not here insist on any significant role played by fungi in the production of different allergic phenomena involving the skin, or the gastro-intestinal or respiratory tracts. It is recognized that this possibility introduces difficulties in reproducing the condition experimentally. The chief difficulty would arise in the laboratory segregation of numerous fractions in order to isolate specific allergens.

In appraising this possibility, we have been

Microphotographs of the so-called "Pasmada Wood" showing the infiltration of micellae of fungus parasites.

Microphotograph of a sample of "ukola" (African Dumeria) which produced the symptomatology described in the text.

aided by the clever manager of one of the visited mills who stated that not all parts of the wood are equally active. A difference may be observed between the cortex and the core of the wood. The degree of decomposition is important.

No less, we have investigated the extent of parasitic invasion of several specimens. We furnished readers the reports as received.

The parasitologist, Dr. Najera Angulo, notes that examinations have been accomplished on two small strips of 8 x 7.5 x 0.6 cm., and 8.5 x 5.5 x 0.8 cm., respectively, and on approximately 15 grams of sawdust mixed from several samples. In no case were observed living Ascaridae or eggs, or dead Ascaridae or traces of them.

The mycologist, Dr. Jordan de Urrieres, at the same time reports they have looked for fungal parasites within different samples of wood, especially in that which is designated "pasmada," finding all quite impregnated by micellae which may be seen in the microphotographs. Identification has not been possible, but as a generality it is believed that their presence is of significance.

F. PERSONALITY AND CONSTITUTION OF THE WORKER. This paragraph mentions the importance of the workers' individual constitutions in relation to responses to the action of toxic woods. We believe with Giorgio Mencioli from his study *"Contributo allo studio delle riniti allergiche di natura professionales,"* that there must be taken into consideration such predisposing factors as heredity, age, sympathetic nervous system, endocrine functions, infectious diseases, abnormalities in the endothelial system, blood chemistry, hepato-renal alteration, abnormalities in carbohydrates and protein metabolism.

As to the over-all pathology, we are disposed to point out two fundamental possibilities in the interpretation of our data: (a) the conditions observed represent a chemical intoxication, or (b) the conditions observed represent an allergic state.

Each of these possibilities is now appraised.

Chemical Intoxication: No author may deny the probabilities of a possible chemical action deriving from chemical products present in the woods at the time of the inauguration of the disease state. However, this may not be the sole and exclusive action. It is recognized that the same disturbing chemical agent might further serve as a sensitizer, particularly when compounded with some protein present in the wood or in the worker himself, among predisposed subjects.

Recorded also is a reflex action indicated by diuresis and excessive sweating. In the digestive and respiratory tracts may be observed analogous irritation effects. Some hemolysis is produced. The nerves, either sensory or motor, are impaired by the actions of saponines. In the total clinical picture there appear dysphagia, vomiting, abdominal colic, diarrhea, malaise, etc. At autopsy there may be observed cerebral hyperemia, meningeal damage, and gastro-intestinal inflammation.

This picture corresponds closely to that observed among our own cases. A similar clinical picture has been described by H. Rasch in the "Encyclopedia of Occupational Health," International Labor Office, Volume 2, page 680.

Allergic State: Most of the authors who have written with respect to the toxicity of wood have emphasized the phenomena of sensitization in particular as to dermatologic lesions. All considered, it appears that greater emphasis has been placed upon skin lesions, but it may not be claimed that any clear demonstration exists that these skin lesions are on a sensitization basis. Those who have espoused a sensitization etiology observe that the new worker is most often afflicted. Gradually tolerance is developed.

Clinical Forms

AT THIS time we recognize two clinical entities representing damage from the woods under study. These are: (a) catarrhal form; (b) dermatologic form.

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These two states may co-exist, and each may be accompanied by systemic disturbances such as fever, asthma, anorexia, sweating, etc., all in variable degree and in keeping with the severity of involvement.

In the first type, the important features are rhinitis, conjunctivitis, pharyngitis, etc., with or without hemoptysis, cough, retro-sternal oppression, dyspnea. Garden believes the picture constitutes a true asthma which he designates as "asthma of the worker in woods." More often, the condition is described merely as catarrhal lesions of the respiratory tract.

In the second form, we may observe skin lesions which vary from simple erythema to severe eczemas. Milian divides the dermopathies due to woods into three types, namely simple, erythematous and eczematous. At times urticaria is present.

Chemical Investigations

WE NOW present the chemical report furnished by the Laboratory of the Instituto Nacional de Medicina del Trabajo. This embraces the studies made by one of the authors. At long intervals chemical analyses have been conducted on toxic woods which were attended by so many difficulties that the investigation cannot be labeled as complete. The first analysis was directed to a wood of reddish color designated by two names: Samanguila, and Ukola. We have accepted it as Khaya Klanei of the family of Meliaceous, but which in the "paniue" dialect is termed Samanguila. The usual qualitative procedures gave rise to a small quantity of soft resin which later proved to have a low content of alkaloids—so low, in fact, that specific identity was not practical. Further manipulations of this resin gave rise to a small quantity of fine dust which proved to possess an intense and bitter taste. More important, it was characteristically sneeze-producing, accompanied by irritation of the nasal mucosa and the throat.

A second analysis was directed to Africa Dumeria of the Sapotaceous family, named by the "pamues" Ukola. It is a white wood with irregular dark lines and less lignified than the first.

A similar cycle of extraction eventuated in the absence of alkaloids but with the distinct presence of glucosides which proved to have the same sternutatory action.

A third analysis reverted to the Samanguila wood, which again provided glucosides but this time without sternutatory action.

By this time it was concluded that the special glucosides encountered might be the offending agents, so that more intensive work was directed to these chemical substances. In due course, it was established that these glucosides may be transformed through hydrolysis to saponines which are still more active as irritants than the glucosides. It was assumed that this transformation may occur naturally in these African wood products under some conditions.

The hemolytic action of the glucosides derived from our first sample of Samoguila was noted, but it was less pronounced than that from the other two samples. It was observed that the hemolytic action was decreased by the addition of a 1% alcoholic solution of cholesterol.

Summary

WE REPORT a small series of cases representing mill workers manipulating exotic woods from Spanish Guinea (Africa). These cases somewhat uniformly presented respiratory involvements. Other cases are known to present or simulate bronchial asthma, and still others exhibited skin involvement. The severity of the situation was such that the sawmills were closed down, so that complete studies were hampered.

The condition, in part, is attributed to contact with the inhalation of wood dust with a content of glucosides which perhaps decomposed to saponines. These saponines acted directly as irritant and hemolytic agents or otherwise behaved as allergens.

Samples of some wood proved to have a high content of fungi but they were not specifically identified. Whether they contributed to the pathology encountered is uncertain.

It is possible that the major manifestation derived from chemical action, but always the possibility of allergy deserves consideration.

A variety of woods have been identified as causative of the lesions described. A reduction to a dusty state such as sawdust may be requisite.

Chemical laboratory investigation describes the presence of glucosides which apparently were somewhat readily transformed to saponines.

[EDITOR'S NOTE: Language barriers have hampered the publication of this report. Entire paragraphs have been rewritten. Various appendices, charts and illustrations have been eliminated. Without desire to alter the author's language intentions, undoubtedly some deviation has been introduced editorially. Any disclaimers that the authors may raise will be respected in the light of language uncertainties.]

HEAVY with the noonday nectar, Jove, among his thunders, nodded—and the world went all awry. It was easy, of course, for him to modify his morrow's potion, but he never did succeed in straightening out his world. This is mentioned only because it *might* have been the point, in far-off time, where personal hygiene and political hygiene diverged—the one to improve until, in this our day, we live in an atmosphere of good-health rules, personal, public, industrial, even economic; the other to get as much worse as there grew to be more of it, until, now, if there were such an expert as a "political hygienist" he would have to be first of all a psychiatrist. Possibly, however, this "wonderland" which has been so prolific of other things may yield him yet.

—Editorial in *Industrial Medicine*, 7:2, 99 (February) 1938.

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Silicatosis of a Micronodular Type Among Women Employed in Glaze Spraying on Metal Objects

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A FIBROTIC action on the lungs attributable to silicate dust inhalation has not been clearly established, up to the present, except the well-known form from asbestos and the doubtful ones associated with kaolin, mica and talc. With regard to this situation, here are reported some cases of lung fibrosis of a micronodular type found among women employed for many years in the glazing of iron sheets, who in such employment have been exposed to the inhalation of silicate dust with a maximum percentage of free silica of 1-2%. It is thought that a particular interest might be found in these cases with regard to the discrete nodules found in the x-ray pictures, and to the etiology from the dust of industrial by-product silicates.

In the literature on this matter there are various references to the possibility of a fibrogenic action on the lungs by silicate dust inhalation. Jones,[5] an English mineralogist, attributed fibrotic alterations of the lungs to the action of sericite, a double silicate of aluminum and potassium, a fibrous mineral of the white mica group, but his opinion has been opposed by other authors. Sayers[8] found serious lung alterations common among the miners of the Broken Hill district in Australia who were operating on a rock containing chiefly sillimanite, a silicate of aluminum with a fibrous structure but with a low percentage of quartz. Badham,[1,2] in this same district and among the workers of the stone quarries in New South Wales, found severe cases of lung fibrosis related to the inhalation of dust of silicates, in particular of the fibrous varieties. This he termed "silicatosis." Koelsch[6] held that free silica derived from the silicates is able to produce lung fibrosis owing to the silicic acid released in the lungs, and in particular whenever they do not contain alkaline substances (or in a negligible quantity) as these forms would hinder the noxious action in the lungs not necessarily of characteristic or disabling quality. Helmers,[4] by his experiments, is led to think that silicates are dangerous because of their mineralogic structure.

As to the risk of pneumoconiosis in glazing work, mention should be made of an inquiry made by Meures and Graef,[7] German authors, who investigated the enamel composition in glazing factories and found that enamel for dipping contains 47-52% of combined silica and 8% of quartz, enamel for spraying 41-45% of combined silica, enamel for powdering 32-41% of combined silica, and enamel for first coating 65% of silica, part of which is free silica. X-ray findings disclosed among 35 workers in a factory glazing by the powdering process, several cases of silicosis (eight of them died from tuberculosis), and among 21 workers in a factory glazing by spraying process a high percentage of silicosis. These cases of silicosis were not apparently severe. X-ray findings included reticular and nodular type. As the enamel for powdering and for spraying had shown silicates in its composition and no appreciable free silica, these cases were thought to be caused by silicates dust inhalation.

THE working process leading to lung fibrosis, here reported, is performed in a factory where glazed iron cookers are manufactured, and consists of the glazing operation by fire on iron sheets used for the cooker's outside walls.

In one shop of the factory, a group of women are employed in the following operations: spraying with aerographs of the powdered enamel in aqueous dispersion onto the iron sheets already prepared in another shop with the first enamel coating; natural drying of the sprayed sheets; cleaning by scraper and brush of dried enamel beyond the limits of spaces to be glazed; firing of the sheets in electric ovens. Some women are employed in spraying and others in brushing and firing. Both groups are exposed to inhalation of the enamel dust released as a mist during spraying and dispersed dry during brushing and firing operations although the work is performed with exhaust ventilation.

The enamel employed always has been prepared in the factory and by the same method for 20 years or more. It belongs to the type of enamel called "sanitary," containing neither lead nor arsenic, and is prepared from the following substances: quartz (25%), potassium feldspar (30%), natural cryolite (15%), tin oxide (4%), plastic clay (6%), borax (15%), soda Solvay (5%), mixed and fused at a temperature from 1100° to 1200°C to form frit, which is crushed and ground to a high degree of fineness in pebble mills, and so powdered is dispersed in water to be applied to the iron sheets by spraying.

It is assumed (and later proved by precise laboratory determination as hereinafter presented) that all free silica in the process of fritting attains to a silicate state, just as is true of glass in which the major original constituent is quartz sand. Thus, the silicates with which we have dealt represent artificially-combined silica rather than any natural state.

Communication to the Tenth International Congress on Industrial Medicine, Lisbon, Portugal, September, 1951.

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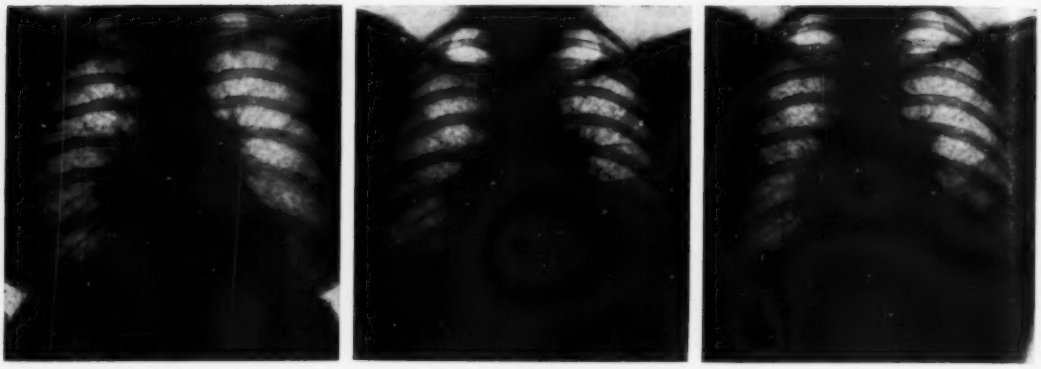

Fig. 1.
Case 1. U.M., age 34, employed in spraying for 12 years. Left, chest radiograph taken October 31, 1949; center, chest radiograph taken April 21, 1950; right, chest radiograph taken July 18, 1951.

This shop is located in a wing of the factory quite far from the other wing wherein is the glazing shop. There is no possibility of transporting any dust with a high free silica content.

Samples of dust sediments in the glazing shop collected at intervals of some months during two years showed, by mineralogical and chemical analysis, the following properties:

Mineralogical analysis: material agglomerated, porous, white, easily resolved by compressing in minimum elements of dimensions not appreciable by means of hand lens. The microscope revealed aggregated elements of dimensions from 1 to 100 micra with a preponderance of much smaller elements of a size of a few micra. The compound, presents a refraction index a little inferior to 1,54 and is in part semi-opaque and has the properties of a mineral amorphous or monometric, as being monorefracting. There is a crystalline phase, that constitutes 1-2% of the sample, of elements of 2-20 micra, wherein are identified traces of carbonates and few elements showing quartz properties in a negligible number.

Chemical analysis: free silica 2% (analysis by phospho-fluoroboric acid method: SiO_2 free residue after consecutive treatments of the material by chlorhydric acid, phosphoric acid, fluoroboric acid, residue purity controlled by volatilization with fluorhydric acid).* In other samples, free silica was found in a smaller percentage of 1% or else was wholly absent. It may be that the small quantity of free silica (1-2%), found in some samples, is released by the wearing down of siliceous pebbles rolling in the mill, wherein the frit is powdered. Crystobalite and tridymite never were found.

The women performing the indicated glazing operations always have been employed only in that shop of the factory, which is located in a small town and is alone of its kind in the place. Never during their lives have they had other occupational activity.

*Special Laboratory of Occupational Medicine Institute of Milan University.

Among them four women, who have had longer occupational periods of from five to 12 years, have shown x-ray pictures of a reticular and micronodular type, as are indicated in the following individual reports: (Chest radiographs are reproduced.)

1. U.M., age 34 (spraying for 12 years): "marked reticulation uniformly diffused with evident peribronchial dissemination of micronodules; moderate enlargement and density of left side of ilus; cardiac tissues within normal limits."

2. T.A., age 30 (spraying for 10 years): "moderate reticulation uniformly diffused with few peribronchial micronodules."

3. V.A., age 36 (brushing for five years): "reticulation moderately marked and diffused, more evident at lung bases, where are noted few micronodules."

4. T.O., age 30 (spraying for five years): "moderate reticulation diffused and few micro-

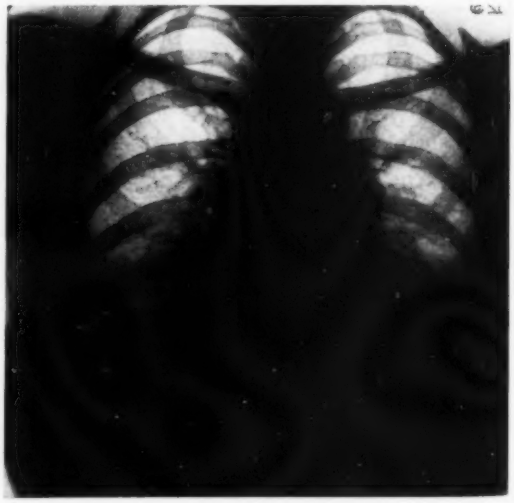

Fig. 2.
Case 2. T.A., age 30, employed in spraying for 10 years. Chest radiograph taken July 18, 1951.

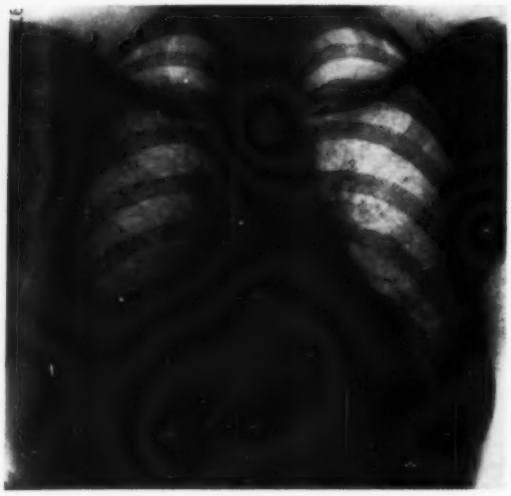

Fig. 3.
Case 3. V.A., age 36, employed in brushing for five years. Chest radiograph taken July 18, 1951.

nodules in both lung fields, density of both ilus shadows."

On the first three women there has been made the electrophoresis examination of blood serum by the Occupational Medicine Institute of Milan University. In the first two were found a definite rise of gamma globulin—but the third one was not found to have significant modification of the normal protein scheme.

Clinical and breathing function examinations of the four women have not shown any note of importance. They appear in good health and carry on their work regularly. In the last years they have not incurred any period of absenteeism through sickness. In order to prevent further exposure they have been transferred to non-dusty operations, and exhaust ventilation has been improved for better dust control. X-ray findings in these women, according to what is known, cannot be attributed to an action of the free silica which by the analysis of several samples has been found in the dust of the working environment only in a proportion of 1 to 2%, or else has been fully missing. It is known that such a percentage of free silica in the inhaled dust will not determine any radiologic manifestation even after occupational exposure for many years. This has been ascertained also by American studies on the subject matter, mainly from an inquiry in silverware factories (Thompson and co-workers)[9] wherein was found, in a working environment dust, a free silica content of 1.75%. No case of lung radiologic alterations was revealed among workers even after an occupational exposure of 10 years.

Never has there been found in the dust samples crystobalite or tridymite or physical states of quartz in the raw material of enamel preparation that could be assumed to have arisen during the melting process and which might have produced fibrotic alterations in the lungs. Therefore, it surely can be affirmed from the women's occupational history that enamel dust inhalation is the cause of their lung fibrotic alterations of a reticular and micronodular type. It is believed that the fibrogenic action is to be referred to silicates composing the enamel.

Summary

IN A FACTORY where cookers are manufactured, among a group of women employed in glazing the iron parts of the cookers in a separate department where spraying, drying, brushing and firing operations are performed, four cases of lung fibrosis of a reticular and micronodular type were found.

These lung alterations are to be referred to the exposure to enamel dust released by spraying, drying, brushing and firing processes, inasmuch as those women have worked only in that department and never have had other employment in their occupational lives. The enamel employed always has been prepared in the factory in the same way for more than 20 years (and according to an original process of the firm), and the enamel dust of the spraying department in analysis has shown, constantly, free silica contents of only 1-2% in the mass of silicates.

The enamel, of the sanitary type, is prepared from quartz (25%), potassium feldspar (30%), natural cryolite (15%), tin oxide (4%), plastic clay (6%), borax (15%), soda Solvay (5%), mixed and fused at a temperature near 1200°C to form frit, which is crushed and ground to a required fineness and dispersed in water to be applied to the iron pieces by spraying. All these operations are performed in a separate department of the factory quite apart from the spraying department, where there is no possibility of transfer dust.

Occupational exposure of the women, who presented lung fibrosis, ranged from five to 12 years.

Silicate dust inhalation is to be regarded as the cause of such cases of lung fibrosis.

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Peripheral Vascular Surgery
— Improved Outlook for Conservatism —

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THE SCOPE of surgery for peripheral vascular disease has enlarged during the past decade owing to the advances in both the care of surgical patients and the evaluation of diagnostic criteria. Although no new surgical procedure has been developed, new principles of treatment have been evolved. The seeming helplessness, short of major surgery, a decade ago has been replaced by more conservative treatment; many individuals have been returned to active useful life with a minimum disability. Some recent observations and results of surgery in peripheral vascular disease will be presented.

Factors Contributing to Arterial Disease

PERIPHERAL arterial disease does not produce symptoms until complications, sequelae or associated pathologic conditions occur. Routine examination and treatment should be directed also to those conditions that are affected by or contribute to the seriousness of the vascular disease. These will be discussed.

Circulatory deficiency in the extremity results from obstructive arterial disease with or without additional circulatory impairment due to vasoconstriction. The viability of the involved tissues depends upon the severity of the circulatory deficiency. Anemia, reduction in blood volume, or a drop in blood pressure due to cardiac failure will increase further the degree of vasoconstriction and should be corrected. The vasoconstriction due to sympathetic activity can be relieved temporarily by the reflex action of heat to the abdomen, sympatholytic drugs, or sympathetic blocks, or permanently by sympathetic denervation.

Anemia and decreased blood volume will contribute further to reducing the circulation in the extremities. This is a serious problem in patients of advanced age with generalized vascular disease and frequently in a poor state of nutrition. The normal quality and quantity of the blood should be restored by transfusions and fluids. Increased protein intake and vitamins are of benefit for hemoglobin formation and for wound healing.

When the cardiac output of blood is reduced, as occurs in myocardial disease, coronary occlusion or fibrillation, less blood will circulate in the extremities. Since many peripheral vascular disease patients have associated cardiac changes or hypertension, a reduction in blood pressure often is accompanied by decrease in the peripheral circulation. Electrocardiographic study should be a part of the examination of these patients and appropriate therapy instituted to increase cardiac output and systemic circulation.

Infection contributes to the unpredictable outcome in the treatment of patients with poor peripheral circulation. When the circulation in the extremities is barely sufficient to maintain the viability of the tissues, infection will hasten necrosis and gangrene. The poor circulation presents a problem in combating infection; systemic drugs are prevented from reaching the infected area in adequate concentrations. The action of intra-arterially injected antibiotic agents is too transient to provide adequate concentration of the drugs and has not proved effective. Another difficulty is that organisms ordinarily sensitive to a particular antibiotic frequently may be found to be resistant, as demonstrated by in-vitro sensitivity tests and by absence of clinical response. The agent selected must be effective in controlling the specific strain of organism. The infection may appear local and insignificant, but, when progressive or uncontrollable, it may be the deciding factor in the loss of the limb.

Osteomyelitis of the bones of the foot or of the toes[1] may be present with extensive cellulitis or abscess formation and very little pain or disability. The bones and joints may be extremely deformed and when occurring in diabetic patients the condition is classified as diabetic neuro-arthropody. On the other hand, a small draining sinus on approximating surfaces of the toes or in the web between the toes may be severely painful and disabling; x-ray films usually reveal a sequestrum underlying the sinus. Adequate drainage should be provided but surgical removal of the sequestrated bone should be delayed until improvement in the collateral circulation has occurred and the acute infection subsided. Frequently the sequestrum will be extruded spontaneously and then rapid healing of the sinus follows.

Diabetes mellitus should be controlled by dietary management and, when necessary, by insulin. Fifty per cent of diabetic patients, prior to the occurrence of infection and gangrene, are unaware of the presence of either the diabetes or the vascular disease.[2] Diabetic vascular disease most frequently affects the smaller arteries and arterioles in the distal part of the extremity. However, the main artery may be occluded also by atheromatous deposits and secondary thrombi. It is essential to know the extent of the vascular disease, for involvement of all the arteries will be of serious prognostic significance. In the

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reported surveys of diabetic gangrene this evaluation seldom is made. In our survey[3] of this problem in 1940, no major amputation was required when the main arteries were patent; only when the main arteries are occluded is the extremity in danger. Further, uncontrolled diabetes will contribute to the difficulty in overcoming infection, and severe infection will contribute to the difficulty in controlling the diabetes. The large amounts of insulin necessary during the acute active stage of infection may be discontinued after the infection is overcome and then dietary restrictions alone may control the diabetes.

Peripheral neuritis or pain in the involved extremity is variable and is not related, necessarily, to the degree of circulatory deficiency or to the presence of gangrene. Extensive gangrene or severe infection and osteomyelitis may be present without severe pain, while mild infection or circulatory deficiency, without gangrene, may be accompanied by uncontrollable pain. Apparently, in many patients, involvement of the nerves in the circulatory deficiency accounts for the severity of the pain. Some of the more severe cases of ischemic neuritis have had positive Kahn and Wassermann tests, and the more severe infections and extensive gangrene with a minimum amount of pain have occurred in diabetic patients. Competent neurologic consultants have been unable to explain the absence of pain when pain should have been a prominent symptom. Sympathectomy may relieve the pain.

Peripheral Vascular Surgery

ADVANCES in the pre-operative preparation and postoperative care of patients and in the selection of patients by better diagnostic criteria have permitted a more conservative attitude regarding surgery; surgery has been more frequently successful. Illustrative cases are described on which major amputations were avoided.

Arteriosclerotic Peripheral Vascular Disease: Diabetic vascular disease usually affects the smaller arteries and arterioles and this accounts for gangrene of individual toes or osteomyelitis of the small bones of the feet. However, many cases also have involvement of the main arteries up to the iliacs. In the non-diabetic the atherosclerotic and arteriosclerotic process involves primarily the larger vessels; in our series of 25 cases of organic occlusion of the bifurcation of the aorta, 23 occurred in non-diabetic patients. It is important to consider the extent of vascular occlusion in selecting cases for particular surgical procedures.

Cases of arteriosclerotic vascular disease and gangrene should be separated into three groups: Group 1, those having occlusion of the smaller arteries and arterioles only; Group 2, those having occlusion of the main arteries only; and Group 3, those having both the main arteries and the smaller arteries and arterioles occluded. The results of oscillometric and skin temperature studies with vasodilator tests will determine the group in which a case belongs. In the first and second groups there have been no major amputations. In the third group 33% of the extremities are being saved now; prior to 10 years ago major amputations were done almost routinely for this group. This improvement is due to antibiotic therapy and adequate lumbar sympathectomy. Six weeks after sympathectomy, to permit development of collateral circulation, the gangrenous toes and heads of the metatarsal bones are removed with a "V"-shaped excision of the soft tissues. No suturing is done and the wounds are packed loosely with vaseline iodoform gauze. Abscess pockets are drained and similarly packed. The wounds heal by granulation. Even when all the toes are removed, good walking stumps are provided. Cultures and in-vitro sensitivity tests will determine the most effective antibiotic for controlling the infection.

The following cases illustrate the results of treating infected gangrene of the toes in extensive diabetic occlusive arterial disease (Group 3).

CASE 1. Mr. J., 56, developed infected gangrene of the first and second toe of the right foot in February, 1950. He was found to be a diabetic and placed on dietary management and insulin. All other laboratory tests were normal. Oscillometric readings were zero on the left ankle, 1.0 unit on the right ankle, 1.5 units on the left thigh, and 3.5 units on the right thigh. Skin temperatures of the toes were elevated reflexly to normal levels by heat (medium heat of electric pad) to the abdomen.

Right lumbar sympathectomy was performed on April 4, 1950, and patient was discharged on the tenth day with excellent improvement in circulation, control of infection and demarcation of the gangrene of the toes. In July, 1950, a foul-smelling abscess developed on the plantar surface of the foot. This was incised and drained. Excellent capillary oozing was noted. Daily dosage of 600,000 units of crystacillin and warm moist 25% magnesium sulfate dressings produced little clinical response. In September all the toes became black and gangrenous, and cultures from the unhealed plantar wound revealed the presence of B. aerogenes, diphtheroids and staphylococcus albus, both hemolytic and nonhemolytic strains. In-vitro sensitivity tests showed the B. aerogenes was resistant to streptomycin, penicillin and sulfadiazine and the staphylococcus was resistant to streptomycin and sulfadiazine. Both organisms were highly sensitive to aureomycin and chlcromycetin. Aureomycin therapy produced rapid abatement of the infection, spontaneous amputation of the toes and complete healing of the foot in two months (Fig. 1).

Recurrence of plantar infection occurred in January, 1951. Incision and drainage evacuated

Fig. 1.
Case 1. Infected diabetic gangrene with extensive arterial occlusion. Initial failure to control the infection was due to presence of strains of the organisms resistant to the antibiotics used. Sympathectomy provided sufficient improvement in circulation to avoid amputation.

the same foul-smelling discharge and there was extensive necrosis of the skin and subcutaneous tissue. Cultures again showed the same organisms that were present previously and the same results on in-vitro sensitivity tests. Control of infection followed the use of chloromycetin and aureomycin and the slough separated, leaving good healthy granulating surfaces.

Comment: Initial failure of the infection to respond to penicillin, streptomycin and sulfadiazine was due to the presence of resistant strains of the organisms. The use of aureomycin, demonstrated by in-vitro tests to be effective against the organisms, controlled the infection. Sympathectomy provided sufficient improvement in circulation to avoid major amputation.

CASE 2. Mr. C., 58, a controlled diabetic, had extreme bilateral arterial occlusion of both lower extremities and gangrene of toes of both feet. Severe anemia was present, without evidence of hemorrhage, and he had an erythrocyte count of 2.2 million and hemoglobin of 6.5 grams. Medical work-up did not establish a cause for the anemia which was corrected by blood transfusions. Oscillometric readings were almost zero on both ankles and from 1.0 to 2.0 units on both thighs. Skin temperatures averaged 27.2 C on the right toes and 28.0 C on the left toes; no elevation followed vasodilator tests. Cultures from the gangrenous toes contained hemolytic streptococcus, streptococcus viridans and hemolytic staphylococcus albus.

Right lumbar sympathectomy was performed on December 30, 1948. Because of recurrent severe gastro-intestinal disturbance a few weeks after discharge from the hospital, left lumbar sympathectomy was postponed until April 9, 1949. Convalescence was again uneventful, and he returned in July for amputation of the toes of the right foot and in November for similar amputations on the left foot. Both feet healed excellently and he resumed full business activity (Fig. 2).

Fig. 2.
Case 2. Bilateral infected diabetic gangrene, left with extensive arterial occlusion. Conservative management with antibiotic and blood transfusions, sympathectomy and minor amputations made possible the avoidance of major amputation, right.

In March, 1950, he had a posterior coronary infarct with an excellent and rapid clinical and electrocardiographic recovery. Oscillometric readings remained unchanged but skin temperatures were still normal on March 15, 1951. He had no further trouble.

Comment: Bilateral extensive organic arterial occlusion with infected gangrene of both feet responded excellently to conservative medical management, sympathectomy and minor amputations. Recovery followed with minimum disability. The organisms responsible for the infection were all sensitive to penicillin. In previous years, without the benefit of antibiotics and blood transfusions, it is doubtful that bilateral high amputations could have been avoided.

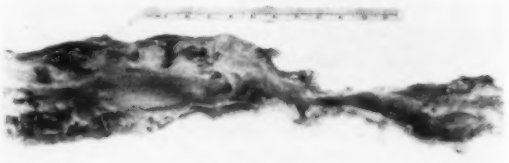

Fig. 3.
Autopsy specimen of thrombosis of the bifurcation of the abdominal aorta. Despite occlusion of the abdominal aorta this patient was treated successfully with periodic Pavaex treatments for nine years. Death was due to blockage of the anterior coronary artery by cholesterol from an atheroma.

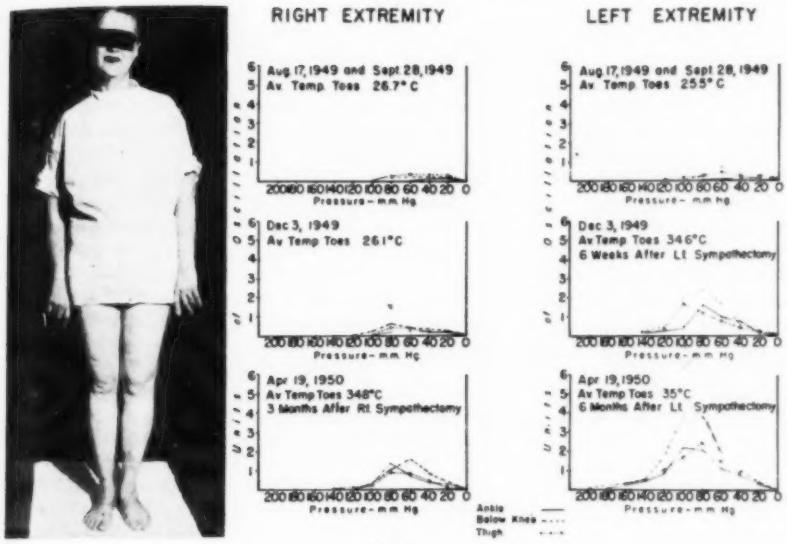

Fig. 4.

Case 3. Left, Mrs. H., right, oscillometric curves and skin temperature readings before and months after bilateral sympathetic sympathectomy. Despite the complete occlusion of the abdominal aorta and progressive course of the disease for eight years, the excellent improvement was still present more than 16 months after operation.

Chronic Occlusion of the Bifurcation of the Aorta: Increasing attention is being given to this clinical and pathologic condition since Leriche's report in 1940.[4] We are preparing a report on 25 cases which represent an incidence of 1.24% in our series of cases of arterial disease of the lower extremities. These cases have a pre-existing disease of the abdominal aorta, usually due to atherosclerosis and arteriosclerosis and to secondary thrombosis (Fig. 3). The bifurcation may be completely occluded and obstruct both iliac arteries or, incompletely occluded, obstructing one common iliac artery more than the other. Accordingly, the clinical picture is variable, as brought out by Welch at the Johns Hopkins Hospital in 1899.[5] The symptoms usually develop slowly and must be differentiated from incomplete occlusion by a small embolus and secondary thrombosis. The coronary, cerebral and peripheral arteries may be involved also in a generalized disease process. Slow, gradual occlusion of the aorta provides time for collateral circulation to develop before the obstruction becomes complete. Lumbar sympathectomy in this instance may produce dramatic results.

The following case of thrombosis of the bifurcation of the aorta will illustrate the results of sympathectomy:

CASE 3. Mrs. H., 51, suffered from progressively increasing intermittent aching and nocturnal cramps in the calf muscles for more than eight years. On August 17, 1949, ordinary walking for 100 feet produced a "tightening or knotting" of the calf muscles and severe aching of the hips, starting on the right side and then becoming bilateral. Otherwise she was in good health. The blood pressure in both arms was 155 over 85. Pulsations in the iliac and leg arteries were absent bilaterally. Skin temperatures of the toes averaged 26.7 C on the right foot and 25.5 C on the left foot. These were elevated reflexly by heat to the abdomen to 32.0 C and 33.0 C respectively. Oscillometric readings were almost zero at all levels on both extremities. X-rays showed marked calcification of the abdominal aorta. Blood cholesterol was 309 mg. %. Other laboratory tests were normal.

Lumbar sympathectomy was performed on the left side on October 20, 1949, and on the right side on January 3, 1950; the second, third and fourth ganglia and chain were removed. Pronounced clinical improvement followed. The skin temperatures increased to normal levels and oscillometric readings increased gradually to normal on the right side and to a lesser degree on the left side (Fig. 4). Peripheral arterial pulsations returned also.

Comment: Despite complete occlusion of the bifurcation of the aorta and the progressive course of the disease for eight years, the excellent response that followed bilateral sympathetic neurectomy was still present more than 16 months after operation.

Peripheral Arterial Embolism: The usual source of embolism of the peripheral arteries is an intracardiac thrombus or a mural thrombus of the aorta.

When the embolus is sufficiently large to block completely the arteries at the arresting bifurcation, the symptoms are sudden and severe; pain, pallor and paralysis of the distal extremity may be profound. On the other hand, a small embolus may occlude incompletely an arresting bifurcation and either vasospasm or secondary thrombosis will complete the occlusion; accordingly, the symptoms may be difficult to differentiate from primary thrombosis. An electrocardiogram may indicate as the source of the embolism a coronary occlusion which had produced a myocardial infarct with mural thrombus or auricular fibrillation, resulting in a thrombus in the auricular appendage.

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Fig. 5.
Bilateral femoral artery embolectomy (Case 4). Despite competent postoperative anticoagulant therapy both arteries thrombosed. Sympathetic blocks and narcotics failed to relieve the symptoms which promptly improved with Pavaex treatments. The patency of the vessels returned within six months.

Published reports[6] that surgical removal of peripheral arterial emboli offers the best chance for saving the limb have not been confirmed by our observations. Three recent femoral artery embolectomies resulted in arterial thrombosis in two instances and the third patient, while on competent anticoagulant therapy, died from embolism of the mesenteric artery. At autopsy the femoral artery was patent. At the Cook County Hospital, 18 successive femoral artery embolectomies resulted in five amputations and 13 deaths. It should be kept in mind that the source of the original embolus is still present and may discharge further emboli despite anticoagulant therapy. Especially in the older age group, suturing of the diseased vessels may be difficult. Among 35 unselected cases of embolism of the femoral artery, treated conservatively, there was one death, and only six limbs amputated.

The following case illustrates the results observed, following bilateral femoral artery embolectomy:

CASE 4. Mrs. C., 34, a known rheumatic heart disease patient, was admitted to the hospital on May 8, 1950, three hours after sudden onset of severe pain, coldness and discoloration of the lower right leg. Her heart was decompensated and was fibrillating. A small embolus was removed within six hours after onset of symptoms; excellent blood flow returned in the artery and anticoagulant therapy (heparin and dicumarol) was instituted. Repeated lumbar sympathetic blocks were done.

Nine days later, while still on dicumarol, sudden severe pain, coldness, numbness and loss of motor function occurred in the left leg. The prothrombin level (two-stage) was 60% of normal. Embolectomy was performed within six hours but the peripheral pulsations did not return despite multiple lumbar sympathetic blocks. The symptoms became worse progressively and codeine, demerol, morphine or papaverine failed to relieve the pain. On the fourth day, Pavaex treatments[7] were started with prompt relief from pain and improvement in the color and warmth of the limb; the patient slept soundly for two and one-half hours following the first one-hour treatment. Oscillometric readings were zero at all levels on the left limb, 1.0 unit on the right ankle, and 1.5 units on the right thigh. Arterial pulsations were absent bilaterally. She continued to improve with Pavaex treatments and she was walking when discharged from the hospital on June 10, 1950. Treatments were continued at home for three months. On November 27, 1950, oscillometric readings were 2.0 units on the right ankle, 0.8 units on the left ankle, 4.0 units on the upper right thigh and 3.5 units on the upper left thigh. Skin temperatures were normal. Except for severe vaginal bleeding, due to continued anticoagulant therapy which necessitated hospitalization and multiple blood transfusions, she made an excellent recovery (Fig. 5).

Comment: Despite bilateral femoral artery embolectomy and competent anticoagulant therapy, both femoral arteries became thrombosed. Failure of repeated sympathetic blocks to relieve the obstructions demonstrated the absence of vasospasm. Pavaex treatments promptly relieved the symptoms and within six months the patency of the vessels returned.

Congenital Unilateral Lymphedema: The cause of the progressive enlargement of one or both extremities is not known. The congenital absence of the valves in the lymphatics[8] has been considered an adequate explanation but recently Schroeder and his co-workers in Sweden[9] describe histopathologic changes in the arterioles. Swelling of the extremity is noticed first as the child begins to walk. In the early years the enlarged limb will reduce in size during the night. Gradually the size may become enormous and permanent and the individual will be disabled seriously by the increased weight. In the female the disfigurement is particularly tragic. Attempts have been made surgically to establish new channels for lymph drainage but these have been largely unsuccessful: fascial strips, silk threads, trefining the bone and incising windows in the fascia with removal of segments of the edematous subcutaneous tissue (Kondoleon operation) have failed to prevent permanently recurrence of the lymphedema. Complete removal of the subcutaneous tissue and fascia has offered the best possibility for relieving the deformity but the magnitude of the operation must be considered. The advances in pre-operative care, anesthesia, antibiotics and blood replacement have lessened the risk of the staged operation and the results of surgery have improved.

The following case illustrates the seriousness of the disability caused by congenital lymphedema:

CASE 5. Mr. C., 17, was admitted to the hospital because of enlargement of the right leg that measured 13 inches more in circumference than

the left leg (21.5 inches to 8.5 inches). There was no pitting and no change in size after remaining in bed for four days. The skin appeared normal.

Swelling of the leg was noted by the parents when the child started to walk at six months of age; no hereditary history was obtained. From year to year the increase in size of the limb was aggravated by frequent attacks of furuncles and cellulitis. A congenital heart condition and undescended testicles were present also. The right leg was normal size.

On August 2, 1950, through a linear incision on the medial aspect of the leg from the knee to the foot one-half of the circumference of the skin was separated from the subcutaneous tissue. The entire layer of fat and fascia covering the muscles was removed. The circumference of the leg was reduced from 21.5 inches to 13.5 inches. Good healing occurred and the patient was discharged on August 11, 1950.

The second stage of the operation was performed October 11, 1950. Through a similar incision on the lateral aspect of the leg the remaining subcutaneous tissue and fascia were excised. The circumference at this stage was reduced from 13.5 inches to 9.5 inches. Except for sloughing of skin edges of the extensive flaps, healing progressed satisfactorily. He was discharged from the hospital on October 23, 1950. There has been slight enlargement since then but shoes were worn comfortably when he was last examined on March 9, 1951.

Comment: The serious disability of congenital lymphedema of the extremities can be relieved by extensive surgery. Blood replacement, control of infection by antibiotics and improvement in anesthesia have reduced greatly the risk of such extensive procedures. Whether the results will be permanent is problematic, but the patient is appreciative of the relief obtained. Usually further surgery is required. The psychologic effect of such disfigurement and the disability make it imperative that some attempt be made to relieve the condition. Major amputations have been required in some cases.

Acute Frostbite: Investigations on the pathology of acute frostbite have afforded a more physiologic basis for treatment.[10] Within 16 hours after thawing has started, agglutinating changes in the circulating blood in the affected extremities will produce a tendency for intravascular clotting. This may lead to thrombosis and extensive gangrene but can be corrected by early anticoagulant therapy. We reported 14 cases treated with heparin and dicumarol[11]; only one patient suffered the loss of a finger although the severity of the frostbite could have produced gangrene of all four extremities. Another patient, with less severe frostbite treated without anticoagulants, four days after exposure developed gangrene of both hands; bilateral amputation of the hands was required. From our observations, anticoagulant therapy started within a few hours after exposure, is important in preventing gangrene in acute frostbite.

The following case illustrates the treatment and clinical course of extreme acute frostbite:

CASE 6. Mr. B., 50, colored, was brought to the hospital in an unconscious condition after more than eight hours' exposure outdoors with the temperature about 10° F. All four extremities were "ice cold, frozen stiff and solid to touch." The pulsations of the dorsalis pedis and radial artery were not palpable and the patient was considered in an extreme condition. Blood pressure was unobtainable and the heart beat barely detectable. Rectal temperature was too low to be recorded on a clinical thermometer. Within one hour after admission and exposure to room temperature both radial artery pulsations were weakly palpable and the blood pressure was 108 over 70. Blood transfusions were given for shock; 50 mg. doses of heparin were given intravenously and repeated every four hours for three days; the extremities were prepared aseptically and sterile pressure bandages were applied. Dicumarol therapy was started eight hours after admission with a 300 mg. dose the first day and 200 mg. doses the second and third day. Initial prothrombin level was 95% of normal and reached 31% within 72 hours at which time the heparin was stopped. The prothrombin level decreased to 12.5% and dicumarol was continued for 11 days. Penicillin in 300,000 unit doses was given every four hours for 14 days and then replaced by oral sulfadiazine.

Except for a low grade temperature that occasionally spiked to 103° F, the patient regained consciousness in eight hours and made a surprising recovery. Marked fibrous tissue formation in the fingers and toes resulted in contracture deformities that improved gradually with physiotherapy treatments. Although all the

Fig. 6.
Severe acute frostbite treated with anticoagulants (Case 6). Gangrene of both hands and both feet could have been expected in this case. Only the right fifth finger mummified and required amputation.

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finger and toe nails came off, only the right fifth finger became mummified and required amputation. Hospitalization for eight months was required, largely because of the need for physiotherapy treatments (Fig. 6).

Comment: From our previous experience on patients treated without anticoagulant therapy, we could have expected gangrene of both hands and both feet in this case. The extreme fibrosis of the hands and feet was attributed to the failure of heparin given every four hours to maintain continuous anticoagulation and absorbability of the extravasated serum. Accordingly, heparin is given now at three-hour intervals.

Summary and Conclusions

MORE conservative treatment for peripheral arterial occlusion and more radical surgical treatment for some vascular diseases are justified at the present time. Advances (1) in the control of infections by selected antibiotics, (2) in the maintenance of fluid balance and of electrolyte, protein and blood levels by blood transfusions and intravenous fluids, (3) in the selection and administration of anesthetic agents, and (4) in the selection of cases for conservative surgical treatment by clinical and mechanical procedures have contributed greatly to the improved prognosis in these cases.

Circulatory deficiency, infection, anemia, cardiac failure, diabetes mellitus, peripheral neuritis and osteomyelitis are serious complications or sequelae of peripheral vascular disease. Illustrative cases of diabetic gangrene, chronic occlusion of the bifurcation of the aorta, peripheral arterial embolism, congenital lymphedema and frostbite are described with results that would not have been expected a decade ago.

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Stop Apologizing

A NEW booklet, prepared for the California Medical Association by ERNEST DICHTER, PH.D., a New York psychological consultant, states that "the term 'medical care' has far outgrown its original—and pure—denotation: the professional services of physicians and surgeons. 'Medical care' now loosely embraces every factor involved in the services, facilities and things attendant upon illness—doctors, nurses, hospitals, drugs, appliances .... Physicians have no control over the national economy as it affects the cost of nursing, domiciliary and other services required by the sick. And yet both individual physicians and their medical associations continue to feel apologetic and to offer public apologies about the high costs of 'medical care.'" DR. DICHTER offers certain recommendations for doctors and medical societies to follow to correct this misinterpretation of the term "medial care": That the doctor stop apologizing for costs over which he has no control. That the medical association realistically make no attempt to change the public concept of the term "medical care" as including the costs of all services and materials incident to the care and treatment of the sick, but that the facts be placed before the public (with sympathetic explanation of the problems of hospitals, nurses, pharmaceutical manufacturers, pharmacists and others whose economy is less flexible than the physician's) pointing out that medical and surgical costs have increased but little in the light of changed economic conditions and that because of this and the fact that doctors deny their services to none, regardless of ability to pay, the "high and/or prohibitive cost of medical care" does not apply to fees of physicians and surgeons.

—*Minnesota Medicine*, November, 1951.

Congenital Anomalies of the Spine

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THE roentgen examination of the spine should include not only the area indicated by the patient as the seat of pain but also a liberal portion of nearby segments. Roentgenograms made in two planes are indispensable; often additional stereoscopic and oblique films are necessary. In large films of the vertebral column, the best detail is obtained only in the center of the film because the diverging rays record the shadows of the spine in the less central portions of the film in a somewhat distorted manner; study of the preliminary large films will often indicate the desirability of several coned, carefully aimed small films to obtain special fine detail.

It is not necessary to emphasize the importance of recognizing the congenital and developmental variations of the human spine. During life both proliferative and degenerative manifestations of disease and trauma must be differentiated from the results of normal processes. In order to evaluate the diagnostic and prognostic importance of variations from the commonly accepted normal, it is necessary to recognize these congenital and evolutional variants, some of which do not cause clinical symptoms,

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Fig. 1.
Congenital absence of the odontoid process.

Fig. 2.
Fabella nuchae. These are sesamoids in the ligamentum nuchae, similar to the sesamoid found in the outer head of the gastrocnemius. They should not be confused with fracture.

and others vary from minor to major significance from the standpoint of differential diagnosis and medicolegal considerations.

The commoner malformations seen in the human spine include absence of one or more vertebrae or additional vertebrae, fusion of vertebral bodies, delayed or accelerated growth or inhibition of growth of parts. Congenital scoliosis or kyphosis is not rare.

Everyone has frequently encountered difficulty in the identification of the lumbar vertebrae. There really appear to exist six lumbar vertebrae in some cases; and once in a while there seem to be only four but it has been demonstrated by Schinz and his colleagues that the total number of vertebrae, 33, is scarcely ever altered. At the most, a fifth coccygeal segment will appear. The most important thing to remember is that the variations in the vertebral column should be recognized as such, and not as a direct consequence of traumatism. It is sometimes puzzling to determine whether a short last rib is the twelfth dorsal rib or a rib on the first lumbar vertebra. It will be helpful to consider that from the evolutionary and developmental standpoint there are a surprising number of

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departures from the average, including a process of transformation in which the boundary between the different regions is displaced. The cranial type of displacement is dominant over the caudal displacement. In fact, there are five transitional zones in the vertebral column: occipitocervical, cervicodorsal, dorsolumbar, lumbosacral, and sacrococcygeal. The transitional zones below the first often present evidence of a definite tendency to shift in a cranial or caudal direction, so that one may speak of a cranial or caudal type of vertebral column. In an individual case nearly always the shift occurs in the same direction in all these transitional zones, though some cases show both cranial and caudal tendencies. There is strong evidence that the direction in which this transitional shift occurs is an inherited tendency. The directional tendency of the variations in the vertebral column is so characteristic in families that it may be of medicolegal importance. About 40% of spines are normal in that no shift is detectable; 26% show a cranial, and 34% a caudal shift (Schinz).

When the parents belong to different types, the children show a dominance of the cranial over the caudal shift, but sometimes the caudal type of shift presents as a recessive, in which case mixed types may result, but this is rare; usually the upper part of the spine shows the cranial type, and the lower the caudal tendency.

The cranial variation or cranial shift is characterized by

1. A cervical rib or long transverse process on the seventh cervical vertebra—longer than the normal transverse process of the first dorsal vertebra.
2. Short twelfth ribs or complete absence of the twelfth ribs.
3. Short transverse process of the fourth lumbar vertebra.
4. Sacralization of the fifth lumbar vertebra.
5. Occasional caudalization of the last sacral segment.

The distinctive features of the caudal variation include:

1. Short transverse processes on the seventh cervical vertebra.
2. Long twelfth ribs.
3. Accessory ribs on the first lumbar vertebra.
4. Long transverse processes on the fourth lumbar.
5. Lumbarization of the first sacral segment.
6. Sacralization of the short first coccygeal segment.

The transverse processes of the fourth lumbar vertebra serve as the starting point for the numbering of the vertebrae, there being less variation of the fourth lumbar transverse process than in the vertebrae at the other points of transition.

Cervical ribs are usually bilateral but vary considerably as to length on the two sides and in different cases. There may be simply a rudimentary first rib which is visible in early life but later assimilates with the seventh cervical transverse process, which is then longer than the transverse process of the first dorsal vertebra. Short cervical ribs may be overlooked very easily in the antero-posterior roentgenogram but clearly seen in the oblique projection. Fully developed cervical ribs resemble normal first ribs and not infrequently are fused with the first

Fig. 3.
Unilateral lumbar rib.

Fig. 4.
Hemivertebra.

Fig. 5.
Spondylolisthesis. Narrowing of the first lumbar interspace; displacement of the fifth lumbar on the first sacral segment; hiatus in the posterior elements of the fifth lumbar.

Fig. 6.
Spondylolisthesis. Lateral view, wide hiatus in the posterior elements of the fifth lumbar; forward displacement of the fifth lumbar on the first sacral segment, but no abnormal narrowing of the fifth lumbar interspace.

dorsal rib. Short twelfth ribs are frequently observed. Sometimes the twelfth ribs are completely lacking. Occasionally one sees the tips of two lateral lumbar processes joined by a strong bridge of bone.

Common anomalies or variations of the vertebral bodies include cleft vertebra, hemivertebra, and block vertebra. Sometimes these three malformations are seen in the same segment of the vertebral column. Cleft vertebra refers to the result of a failure of fusion between the two mesenchymal masses constituting the protective anlage of each vertebra. If the fusion does not take place, the result is "cleft, or fissured vertebra." The cleft may be sagittal or horizontal. The general structure of such a vertebra is somewhat broader than that of the normal neighboring vertebrae. According to the shape of the deformity these malformations cause scoliosis and kyphoscoliosis.

Development of only one half of a vertebra produces hemivertebra, though sometimes rudimentary portions of the missing vertebral arch are present. The hemivertebra is usually a supernumerary vertebra. Of the isolated congenital defects in the spine, lateral and dorsal hemivertebrae and the so-called butterfly vertebra are the most common. Lateral hemivertebra is a fairly common finding and is usually seen in connection with high grade scoliosis. In these instances the hemivertebra, pressed into the shape of a wedge, is interposed between two normally formed vertebrae. In the dorsal region curvature develops with this malformation.

Two or more vertebrae may become fused in the process of ossification, forming the so-called block vertebra. This occurs normally in the sacral region, but may be found in any portion of the spine. If only the anterior margin fuses, then the posterior portion of the vertebra continues to grow and the fused vertebra develops a wedged shape, narrower in front. In the dorsal region the corresponding ribs may also be fused. Block vertebra is often mistakenly considered as healed tuberculous spondylitis or the result of trauma.

Partial development or even absence of the odontoid process is occasionally met with. It has practical importance, since there may occur anterior luxation of the atlas.

Klippel-Feil disease is a term applied to a combined vertebral deformity, combining spina bifida, hemivertebra, block vertebra and clefts of the neural arches. The portion of the vertebral column where the lesion is located is shortened, either by kyphosis or scoliosis or both. This malformation occurs most often in the cervicodorsal and in the dorsolumbar region. In the first mentioned location the deformity is often associated with congenital elevation of the scapula (Sprengel's deformity). It may be mistaken for healed spondylitis.

A supernumerary ossification center which

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Fig. 7.
Hiatus in the posterior elements of the fifth lumbar; no narrowing of the fifth lumbar interspace; only slight forward displacement of the fifth lumbar vertebra.

Fig. 8.
Herniation of the cartilage between the epiphyseal ring and the body of the fourth lumbar vertebra. Congenital, not to be confused with fracture.

may continue as a persistent epiphysis in the transverse processes of the cervical and dorsal regions has led to a mistaken diagnosis of fracture. Hiatuses or weak spots amounting to solution of continuity have caused erroneous concept of fracture of the tip of an articular process.

Congenital faults of the vertebral arches (called pedicles by Chandler) are the most common aberrations from the normal, but clefts may also occur in the midline or in the laminae. One frequently sees the posterior arch of the atlas divided, or even complete absence of one half. These are harmless anomalies.

Lesions of the intervertebral disks do not constitute congenital variations, but they sometimes give rise to vertebral aspects which must be carefully analyzed for differential diagnosis. Changes occur especially in childhood and adolescence which are of important interest in diagnosis.

In 1921 Scheuermann, of Copenhagen, described a disease appearing from the fifteenth to the seventeenth year, chiefly in males, as a dorsal kyphosis, attended by signs of pathologic changes in the epiphyseal line, similar to those found in other osteochondritic lesions found especially in the hip, the superior tibial tubercle, the wrist, the ankle, and many other joints. The epiphyseal disks show more or less pronounced irregularities and deformities in the epiphyses, especially at the anterior edge of the upper and lower surfaces of the vertebrae. A cup-shaped anterior marginal aspect may be seen in one or more interspaces, a residue of which is often seen in adults. A moderate wedging may develop in one or several vertebral bodies. Ultimately the vertebral edges will become smoothed over but the deformity persists.

The lesion is said to occur in the lower dorsal region. Symptoms begin around 12 years at the earliest, 17 at the latest.

In certain affections the porotic vertebral bodies yield to the pressure of the firm healthy nucleus pulposus, so that the contiguous surfaces of the apposing vertebrae become indented or scalloped, giving rise to a form of vertebra, sometimes designated as "fish" vertebra. These changes occur in various malacic disorders and in metastatic lesions, multiple myeloma, and sometimes in Paget's disease. If the nucleus pulposus undergoes degeneration, then the disk itself yields and the porotic vertebra may remain undeformed.

When the disk has suffered serious degeneration such as dehydration, fissures or fibrosis, the contiguous vertebral surfaces undergo reactive sclerotic changes and become somewhat uneven. Sometimes the intervertebral disk becomes calcified; the annulus fibrosus also may become calcified. If the disk is broken up by trauma or otherwise destroyed, the contiguous vertebrae may undergo fusion, forming the so-called block vertebra above referred to.

Invasion of the vertebral body by discal tissue may occur through fissural defects in the annulus fibrosus or in the cartilaginous plates, giving rise

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to hernia of the nucleus pulposus or Schmorl's nodules. If the fissure occurs in the posterior section of the annulus fibrosus, then discal tissue may herniate into the vertebral canal. When the herniation occurs through faults in the cartilaginous plates, Schmorl's nodes are formed by intrusion of the nucleus tissue into the spongiosa. The vertebral surfaces are pitted but at first these defects are invisible. They become visible roentgenographically when they take on a thin shell of ossification. The nodules have no clinical significance, except when they are found in adolescence in multiple form in the same disk.

If the fissure of the cartilaginous plate is located near the margin of the vertebra, the wandering disk tissue may undermine the edge of the vertebra and even ultimately detach it from the vertebral body. There appears a clear space between the body of the vertebra and the epiphysis, limited to the anterior upper or lower margin of the vertebral body, usually in the lower thoracic or upper lumbar region, and best seen in lateral films. Ultimately there appears on the anterior superior margin of the vertebra a fracture-like, oblique cleft, with sclerotic edges. This may persist permanently or it may become filled with loose spongy tissue. The degenerated fragment of bone which in lateral roentgenograms appears as a triangular bony bit, may become highly porotic. These clefts at the anterior vertebral margin are somewhat infrequent but they should not be mistaken for fracture.

The lumbosacral region is the seat of many congenital variations. In the opinion of the writer many are dependent upon development of clefts in the articular portions of the neural arches; only rarely is the cleft unilateral. In the greater majority of cases this occurs in the fifth lumbar vertebra; more rarely in the fourth, and only very exceptionally in the third or second lumbar vertebrae. Spondylolisthesis may be first seen in infancy, but usually after the twentieth year of life, more often after the fortieth year of life, and more frequently in men than in women. Undoubtedly it would be found more often if the spine were studied more frequently in the teen ages. In the opinion of the writer spondylolisthesis is rarely encountered as a result of an acute accident but is due to gradual development of the displacement because of a congenital cleft in the neural arch. Such clefts have been found in the embryo. The cause of such formation is unknown. As the clefts do not seem to be observed until in adult life, separation of the fissured arches is considered to be the result of overloading, and a creeping or insufficiency fracture takes place. Fracture of the vertebral arch, it is universally agreed, is likely not the result of single traumatic incident. The upper surface of the sacrum usually lies almost vertically and surely favors the development of listhesis of the fifth lumbar vertebral body.

Summary

WE HAVE briefly discussed some of the anomalies occurring in the human spine. The list is not complete by any means; an entire chapter might be written on the sacrum and its variations. The current publication of the work by Hadley on accessory sacro-iliac joints is a valuable addition to our knowledge and explains the pathology and symptoms and indications for treatment in an important group of sufferers from sacro-iliac pains. From the medicolegal standpoint it is important that these anomalies be recognized.

It is not intended to say that symptoms may not result from the anomalies of development. They often do lead to the evolution of symptom-producing conditions which in some cases are of grave importance, such as spondylolisthesis. The prime purpose of this communication is to urge the differentiation between serious pathologic states due to trauma and those which are secondary to congenital anomalies.

(2315 Bath Street)

Artificial Respiration

TECHNIQUE OF THE BACK PRESSURE—ARM LIFT METHOD: The subject is placed prone, elbows bent, arms overhead with one hand upon the other. The cheek is placed on the hand, the face turned slightly to one side. The operator kneels on one knee at the head of the subject and puts the foot of the opposite leg near the elbow. He places his hands on the subject's back, in such a way that the thumbs just touch, the heels of the hands being just below a line running between the armpits. He rocks slowly forward, elbows straight, until his arms are approximately vertical, exerting steady pressure upon the chest. Then he commences to rock backward slowly and slides his hands to the subject's arms just above the elbows. He raises the arms until resistance and tension are felt at the subject's shoulders. Then he drops the arms. This completes a full cycle. The cycles are repeated 12 times per minute, the expansion and compression phases being of equal length, the release periods being of minimum duration. A standard technique for administering the method is being prepared by a committee representing many organizations.

—From the Joint Statement issued by the A.M.A. Council on Physical Medicine and Rehabilitation and the American Red Cross (*J.A.M.A.*, 147:15, 1454 (December 8) 1951).

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The Role of Nurses in Industry: A Straight Road to New Horizons

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JUST as industrial medicine has evolved from a narrow specialty into one of broad scope, industrial nursing now takes its place in teams geared for production. It follows then that if nurses are to function at maximum efficiency in such teams, they must take their place in the whole functioning organization.

It is not entirely necessary for each individual in every organization to know as well as understand the part played by each other person. Thus, management problems and problems of production are not the first concern of the industrial nurse, nor is it the first concern of management to seek her views on these subjects. Nevertheless, management is coming to realize the great practical values the nurse brings to industry, and, as this realization has increased, the established duties of nurses in industry have come to include authorized emergency care for all occupational injuries, supervised treatment of occupational injury and disease, and the emergency care of non-occupational diseases and injuries with referral to the patients' own physician if further treatment is necessary.

FOR the performance of these duties a health unit and a health program are necessary. In this there must be provision for adequate preplacement, periodic, and annual examinations. These are the inventories of the human stock in any enterprise and, while human stock is the most valuable of all assets, it is the most difficult to assay with any real degree of accuracy since professional skills do not always prove adequate for the task. More often the capacity for understanding people and the ability to communicate with them are far more effective than the precision tools of medicine. Thus we find that a knowledge of humanics as practiced by the industrial nurse may be just as effective as the electrocardiograph in obtaining a complete and significant medical history. In the same way a nurse's tact and patience in introducing and explaining the need for medical histories and physical examinations not only initiate a proper start toward intelligent cooperation in health programs but also go far toward reassuring the questioning individual that such programs instead of being screens and barriers toward employment or continuing employment are set up and operated with the immediate welfare of the worker uppermost in mind. It is indeed through such professional conduct that the traditional practitioner-patient relationship —the ideal of industrial medicine—is extended and strengthened.

IT IS "standard operating procedure" for the industrial nurse to perform her duties under the direction of the industrial physician. This, however, need not prevent her from being on the lookout for symptoms of incipient disease which she may be able to detect through the professional confidence she receives. Moreover, her success in interviewing employees on their return to work after enforced absences may become the prime factor in determining their fitness for work and their need for periodic examinations or follow-ups for the correction of remediable defects. This particular function of the industrial nurse also includes liaison work in rehabilitation where individual placement of workers, according to their physical and mental fitness for work, is all-important.

The ultimate responsibility for all of these phases of medical service belongs to the industrial physician, but where a full-time plant physician is not provided it is the clear duty of the industrial nurse to be the connecting link in the chain of professional care. Her success in such an undertaking will prove with certainty the difference between the nurse finger-wrapper and the practitioner of industrial nursing as a profession.

An additional list of activities would have to be included to complete even an outline of the role of the industrial nurse. Many of these items are subject to expression only in general terms. Many are intangible; some even border upon the imponderable. Nevertheless, the industrial nurse who is equipped with only a reasonable amount of common sense will find that many of these concepts, even those considered merely vague, are capable of translation into clear thought, and thence into practical action.

First and last, actually, the role of the industrial nurse in the exercise of common sense for the accomplishment of specific aims. Health education—often a problem in expression—becomes practicable if common sense is its basis. Poster, pamphlets, lectures, and demonstrations may otherwise be shallow and ineffective. Yet, these first aid classes, the proper use of protective equipment, minimum requirements for

Opening address, Industrial Nursing Workshop, University of Houston College of Nursing, Houston, Texas.

illumination, ventilation, cleanliness, eating places, recreational programs—how necessary they all are! But how uninspiring, sometimes, they are made, or seem to become! They need not be. It is the nurse's job to pick those that are inspiring and effective. Very often this may be accomplished by a combination with local, regional, state, or national campaigns when such campaigns are made active issues.

At times, however, there is the feeling that all of this reaches toward an ideal in industrial nursing which has little connection with the day-to-day nursing tasks in industry. And in industrial nursing today we include attendance at committee meetings—sometimes they are plodding committee meetings—safety conferences, inspection critiques, suggestion clinics, even the development of recreational programs and welfare projects, not to fail to mention cooperative efforts with community agencies in occupational health and welfare. Then, too, there is in all health programs in industry the consuming demand for paper work in the form of records and still more records to the point where writing seems to call for more writing.

All this is hard work, but does it necessarily follow that it must be tedious and dull to the point of boredom? Must routine become the death of inspiration? It need not happen to you. The very routine, which now so often seems so much to throttle you, may actually open the way toward broader and therefore more significant, more fruitful, fields for thought and action. Let us examine this further.

FIRST of all, the part played by nurses in industrial medicine should include the part you play collectively. Much of what has been outlined above is well known to you as individuals. Look at it again and you will see that it is but a paraphrase of standards set by your own organization for the purpose of making you specialists in your field. As specialists you operate with a body of knowledge formed from experiences. But it should be emphasized that, important though certain of these experiences may have been, they are, in a manner of speaking, isolated events. Taken together, however, they constitute the body of specialization, the body of highly technical endeavor. Thus your specialty —any specialty—derives from the part individuals play collectively.

As is the case in all specialties, however, individualization and a narrowing of perspective will grow as improvement in technic is gained. Therefore in your efforts at improvement you must strive to repress the tendency to seek only the answer to your individual problems. Take time to explore the collective role of nurses in industry. Taken collectively, the role of industrial nursing is of far greater significance and has far deeper potentialities than the most important job in the entire practice of your specialty. It will only be through collective effort that this role can become fully vivified and made to make itself felt to a degree of real significance. This is not meant to say that the traditional and prescribed work-pattern of industrial nursing needs to be entirely re-cast. On the contrary, the success of nursing in industry does, and will still, depend upon the exercise of the same high degree of professional skill which has established industrial nursing in the list of recognized specialties, whatever the results of collective effort.

But today we are thinking in terms of group effort, and by so doing we perceive the need for a broader outlook and a deeper understanding of the social forces that shape our times. Note well that physicians are being asked if the individual practice of medicine is truly realistic in the world of today. Precisely the same question could be asked of many programs for industrial nursing. In formulating an answer we should be reminded that both legally and traditionally the practice of our closely allied professions has been and should remain highly individualized where each individual is concerned. If that were all, the matter could be considered closed. Unfortunately for the ease of simplification we are compelled to recognize that medicine is a great and complex social force into the orbit of which has been drawn much of our knowledge, much of our practice in the science of human relations. This is especially so of late. The understanding of medicine as a great social force and the channeling of its great drive may never be completely possible, so powerful is it, and so complex its origins. Nevertheless, the understanding, at least, of the needs which support public health action, itself a part of this great moving body, may be, as Thomas Parran told us more than a dozen years ago, "The greatest contribution to social peace in our time."

TO UNDERSTAND this concept it is necessary to realize that individual experiences, individual situations, and individual cases are, by their very nature, inconclusive simply because they are incomplete. The most extensive individual practice in the world would fail to yield a body of knowledge suitable for the understanding of human needs and the political actions motivated by them. And as for social science, workers in that field have contributed barely more than a sketchy outline of the pattern by which man in groups has come to live and have his being. What then is missing, where we particularly are concerned?

It is the individual well trained and well versed in humanics, a practitioner trained in the philosophies of the collection, correlation and the interpretation of data, data that bear upon all of the facets of industrial relations, particularly those relating to health and medical care since they are of utmost importance.

The best possible nomination for such a post is the industrial nurse. She is already practicing

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what she knows of humanics; she needs only scientific training in investigative effort together, plus that same zeal and enthusiasm which wrenched industrial nursing free from the humdrum of floor duty. She needs more than all else the imagination which broke the unimaginative confines of finger-wrapping as a job. Given that creative imagination, industrial nursing will be on the way toward making a significant contribution to the science of the understanding of people, the science which explains why workers in industry act as people; or, as the case may be, why they do not.

Must we then go on saying that little so far has been done to search the great fund of information so readily available to you? This vast store of data is open to you: open for study, and open for contribution as well. Those records and their recording, so many times anathema to you, are yours for extension into areas of real significance. Here indeed is a challenge to industrial nursing collectively, a challenge to extend the present limits of our practical knowledge of human affairs. Mind you, what you are doing here is not to be gainsaid. Collectively your organization is gathering force, a force which has grown through your banding together under standards set high above the ordinary level of professional activity. Indeed, you are to be congratulated that your organization adjures you to read, and to study professional and industrial publications. Study groups such as this Workshop have both intrinsic and extrinsic values, and when you attempt the solution of problems such as these which fill your agenda here, you may be reasonably sure of not falling behind the times. Later still, your collective participation in civic organizations—a part of your professional responsibility—will go even farther toward extending the good influence of your work.

BUT all this does not go far enough. The universities and colleges beckon you. They challenge you to fill these gaps in the outlines of sociology. They call you to lift your specialty still higher above the pension-and-pittance level of professional and intellectual mediocrity, a level where other professions so often come to rest so complacently. Remember, though, that this challenge, this opportunity to make a real contribution is vouchsafed to those whose training and practice will combine to make new researches both essential and momentous, and bear in mind as well that this is an opportunity not open to the zealot, but only to the receptive and the prepared.

Such being the case, the role of nurses in industry includes not only the practice of technical skills but also a summons to the highest levels attainable by the learned professions. The hard rock of your dullest routine bears a vein of the mother lode we are all seeking. Collectively you can produce the needed tools. You already have the workers, and, in your own ranks, without doubt, the creative influence of genius.

The acceptance of this challenge may well become one of the more significant facets in the role of nurses in industry today, while the product of your research accomplishments will bring full vivification to an already major role.

The Threshold

ONE by one our friends are taken, each with his summons "by the same post as the other." One by one they heed the call, and put aside their work, and are gathered to their fathers. And when they are gone we pause a moment, in regret, in tribute, and—whether we admit it or not—in wonder. Individualists we are, and materialists, knowing most intimately those we knew in the contacts which present the pathology of material, and come to their end in the pathology of the dissolution of that material. But is that all? Within the structure of elements and cells that made the man, what was it made the *man?* Is the individual span a candle flame, guttering to final extinction in its fleshly sconce? Or is it the cycle of a wheel, which, having made one turn is ready for the next? Nothing that is understandable in terms of pathology can answer. Nor, indeed, are the terms of other sciences more eloquent. The life is gone, and all of science has no more to say. But when it is a life we knew and respected, we pause—hoping we have only said "adieu." And thus, whether we acknowledge or deny, we have stood a moment at the threshold of faith.

—Editorial in *Industrial Medicine*, 6:2, 108 (February) 1937.

An Evaluation of Hand Grip in Industry

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THE problem of grip, its interpretation, measurement, comparison of right and left, and finally an evaluation for industrial rating has long confronted the industrial doctor, insurance carriers, plants, and accident commissions. To date, little actual work has been done to determine the normal grip. Thousands of ratings are recorded every year on loss of grip following an accident, yet the basis of such evaluation lies in the realm of uncertainty.

This study has been conducted to help shed light on some of the many questions that must be answered before an evaluation can be made, approaching a fair basis for both patient and carrier. It is hoped that it will reveal some of the glaring mistakes of the present system of evaluation in grip testing and that further study will be stimulated.

One thousand individuals embracing both sexes and of ages ranging between 18 and 65 years, representing the various groups of skilled, semi-skilled and unskilled labor required in industry, were tested for grasping power in their right and left hands. These were all applicants for employment, with no major physical defects, and the tests represented the maximum effort of those taking part in them, with an average of three trials each of right and left hands.

The test for maximum effort was determined by observation of blanching of the joints of the fingers and degree of muscle contraction palpated in the forearms. The greatest motivating factor in the tests was considered to be psychological, inasmuch as these people were all applicants for employment and were told that a good grip was essential for passing their examinations. A standard-type spring steel gripping mechanism manufactured by Sklar was used. Using this type of machine there is a physical discomfort experience, owing to the steel pressing against the soft tissues of the hand. However, since this was a constant factor for all tested, it was felt that it should not appreciably alter the gross percentage.

Upon completion of the series, the average grasping powers of right and left hands of the various age groups were studied and compared. These were also analyzed with reference to type of work customarily done by the individuals and with reference to sexes. Percentage differences were computed between right and left hands, the right being the applicant's major hand in all cases.

The following Tables show kilograms of grasping power and percentage differences as classified in accordance with age, sex, and skilled, semi-skilled or unskilled labor customarily done by the individual.

TABLE I.

Age Group	Average Grip Right	Average Grip Left	Percentage Difference
Male			
18-19	118.8	99.7	10.7
20-25	123.1	111.3	9.5
25-30	123.8	117.6	5.0
30-35	126.4	107.4	15.0
35-40	126.0	113.2	10.1
40-50	114.6	102.6	10.8
50-65	110.0	93.6	14.9
Female			
18-65	63.2	49.1	25.4

TABLE II.

Type of Work	Average Grip Right	Average Grip Left	Percentage Difference
Office	104.0	89.6	13.84
Laborers	119.38	106.42	10.8
Skilled	124.9	115.5	10.7
Semi-skilled	132.3	119.4	9.7

Observations were made as follows:

1. The percentage differences of 10 used by some authorities as an average for the population as a whole held true in certain age groups and skills, while in others it differed markedly.
2. It is noteworthy that in the early age group the average grasping power is similar to that found in the late age group, and that the strength of the grip reaches its maximum between the ages of 25 and 40. The percentage difference is least in the 25 to 30 years age group, indicating a more nearly equal development of the forearms.
3. As would be expected, the average grip of the female is far below that of the male. There is a greater percentage difference between the right and left hands, indicating a more unilateral usage.
4. Male office workers rank next to female workers in lack of arm development.
5. While there is some difference between the classes of skilled labor, semi-skilled labor and common labor, the actual percentage difference between these groups is small.

SEVERAL conclusions can be drawn on the basis of this series in regard to the working man:

A. In rating these individuals it would be most important to consider age in order to make comparison and evaluation with reference to the proper age group.

B. Sex. It is obvious from the findings of the chart that in comparing grasping power there is to be expected a difference between that of the female and the male.

C. Type of Occupation: This does not mean the type of occupation in which the individual

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is presently engaged, but should refer to the occupation regularly done during the working portion of his (or her) life. While strength of grip does not differ to any great extent for skilled, semi-skilled or unskilled labor, there is a marked difference between office or supervisory workers and the other three classes mentioned.

D. While obvious physical factors can be observed in evaluating grasping power, such as noting degree of blanching of finger joints and palpation of muscular contractions of arms during efforts of those being tested, the will to grasp by the individual may be of utmost importance. Naturally, this will to grasp is impossible to measure and can only be estimated, especially in cases being presented for rating.

E. Types of machines used by the examiner to determine strength of grasp will also alter the measurements in pounds or kilograms registered during the tests, inasmuch as the patient should be able to grasp a soft, yielding type of machine with greater pressure than a more resistant machine which causes more painful stimuli. However, the average percentage difference measurement in the major and minor hands should not vary to any great extent by the use of either of these two types of machines.

F. It is the opinion of the writer that plants doing routine physical examinations for pre-employment should include gripping tests in their examinations. Permanent records of such tests would prove invaluable as a yardstick for any future disability evaluation for hand or arm injuries. The same machine could be used for measurements as in the original examination and thus afford a constant factor for the grip test. Hence, a more accurate result would be obtainable than is possible under the present system of pre-employment physicals wherein no test of the grasping power is made. This results in leaving nothing for comparison except the routinely used tables which allow an average of 10% difference between the major and minor hands. As shown by this series, this percentage is often inaccurate.

Perhaps the most valuable information obtained in this series of tests was that many persons giving a history as far as accident or injuries involving the forearm or arm were concerned, when confronted with the gripping test were under the impression that old injuries would be demonstrated and with that in mind gave elaborate histories of old injuries.

Conclusions

1. The patient's age, sex and type of occupation should be considered in determining grip.
2. The patient's "will to grip" should be estimated as closely as possible by the examiner.
3. Industry should have a grip test for all pre-employment examinations. These should be a part of the permanent medical record of the employee.
4. Injured individuals receiving ratings should be grip-tested by the same examiner and with the same "gripper" as when employed. These readings can then be compared with the original pre-employment readings.
5. Further studies should be conducted in the field of "grip" so that a better method of standardization can be obtained both for the human element and the type of standard gripper.

(5592 Santa Fe Avenue.)

President, 1789-97

GEORGE WASHINGTON retired three times in his life. After each time he became neurotic and introspective. He complained of a number of inconsequential functional disturbances. In other words, the father of our country became neurotic when he retired from active service. Washington was born in February, 1732. After he had retired from command of the Virginia militia in 1758 because of ill health he wrote, at the age of 26, "I have now too much reason to apprehend my approaching decay." However, in June, 1775, at the age of 43, he returned to command the Continental Army, and, of course, distinguished himself. In 1783, when he was 51, he wrote, "The scene is at length closed. I will move gently down the stream of life until I sleep with my fathers."

—From "Growing Old Gracefully," in *West Virginia Med. J.*, January, 1952, quoting EDWARD L. BORTZ, M.D., in *J. Michigan State Med. Soc.*

Rheumatoid Arthritis
— Experiences with Cortisone (Compound E), other Adrenal Cortical Steroids and Pituitary Adrenocorticotropic Hormone —

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EVENTS of the past year have been of historic importance to those concerned with the problems of acute and chronic rheumatism. Prospects for arthritic patients have been improving for some time. Steady advances have been providing new hope for rheumatic sufferers, new tools for practitioners and research workers, and even specific cures for some forms of rheumatic disease. And now it appears that a truly great discovery has been made in connection with the treatment of rheumatoid arthritis.

In September, 1948, Hench, with his chemical colleague, Kendall, and his clinical colleagues, Slocumb and Polley, initiated a series of physiologic experiments which have yielded extraordinary results. Publication of those results has made a historic impression upon the medical scene of our times.

The stage was properly set for their discovery. For 20 years Hench and his co-workers at the Mayo Clinic have been studying remissions which occur spontaneously in patients with rheumatoid arthritis. Pregnancy, jaundice, anesthesias, starvation, and some forms of shock therapy have been known to provoke such remissions. Study of them appeared to indicate that the common factor present in their several circumstances was stimulation of the adrenal cortex. Consequently, many adrenal products were tested in attempts to reproduce this phenomenon. It is interesting that this search should have uncovered an effective agent, the adrenal cortical hormone, cortisone, the existence of which was discovered at the same medical center, where, later, this application to rheumatoid arthritis was found to be effective.

In 1935, Kendall and his co-workers had isolated from adrenal glands a steroid substance possessing great power for controlling symptoms of Addison's disease and for maintaining the health of adrenalectomized animals. This steroid was found to be 17-hydroxy-11-dehydrocorticosterone (Compound E, now called cortisone). For years, it was available only in minute amounts, and not until the stimulus of World War II intensified work in this field was its artificial synthesis completed.

Patients with rheumatoid arthritis to whom this hormone was administered showed prompt cessation of forward progress of their disease, and articular swellings were rapidly, though only partially, dissipated. Remissions observed in these individuals were similar to remissions which had been observed in consequence of intercurrent jaundice or pregnancy.

This new measure differed from therapeutic tools previously available for rheumatoid arthritis in that improvement which resulted from its application was so marked and came so promptly. Results with it surpassed by far those occasionally obtained with "old-fashioned" measures such as physical therapy, vaccines, and gold. Changes which were produced appeared rapidly, became evident within a few days after beginning the use of cortisone, and affected not only subjective symptoms and visible deformities but also the laboratory abnormalities which distinguish this disease.

After discovering that an adrenal cortical hormone could seemingly stop the progress of rheumatoid arthritis, these workers turned immediately to tests of adrenocorticotropic hormone (ACTH) of the pituitary gland as a treatment measure. This was a logical move, because the adrenocorticotropic hormone is capable of stimulating production of adrenal cortical hormones. It is now common knowledge that results with adrenocorticotropin were essentially the same as with cortisone. Thus, a whole new world of therapeutic research had been opened up for exploration and conquest.

In the spring of 1949, through the courtesy of Dr. James M. Carlisle, of Merck & Co., Inc., small amounts of cortisone were made available to our research group at Michael Reese Hospital. This group has been functioning actively, steadily expanding its work in this field. In addition to conducting preliminary clinical trials and metabolic observations with cortisone, we have carried out various studies of the adrenocorticotropic hormone, and have made therapeutic tests also with a number of steroid substances found among products of adrenal cortical secretion. A brief review of these experiences now appears:

Experiences with Cortisone

COMMENTS ON CHEMICAL CHARACTER AND PHYSIOLOGIC EFFECTS: Cortisone, the acetate ester of 17-hydroxy-11-dehydrocorticosterone, was supplied to us as a suspension of the crystalline material in saline solution to which benzyl alcohol had been added as a preservative. This potent hormone is one of four crystalline compounds isolated from extracts of the adrenal cortex by Kendall and his associates in 1935. These compounds, designated A, B, E, and F, are distinguished chemically from other adrenal cortical hormones by the presence of an oxygen atom at the eleventh carbon atom of the basic ring structure upon which the compound is con-

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structed. Because of this oxygen atom, the series has been designated the C_{11} oxysteroids.

Known physiologic effects exercised by cortisone and by other C_{11} oxysteroids are numerous and cover a wide range of metabolic functions. Perhaps most important of these is an ability to mobilize resistance of the animal organism against many types of stress. Adrenalectomized animals, which have been protected by administered C_{11} oxysteroids, are capable of resisting a variety of injuries which prove fatal to unprotected animals. This remarkable power is not inherent in the action of adrenal cortical hormones lacking an oxygen atom at the eleventh position.

Other physiologic effects exercised by C_{11} oxysteroids bear upon several phases of carbohydrate, protein and fat metabolism. For example, administration of cortisone to adrenalectomized animals induces an increase in the level of blood sugar, increased resistance to insulin, and, if glycogen stores have been depleted from the liver, these are restored. Patients with Addison's disease show greater resistance to insulin under cortisone therapy and a trend towards higher levels of blood sugar.

Conversion of protein to carbohydrate is accelerated under influence of cortisone, and in consequence a patient receiving this compound shows an increased rate of nitrogen loss. Depot fat is mobilized, renal clearance of uric acid increased, and the circulating eosinophiles decrease in number.

Another important effect of cortisone is inhibition or depression of pituitary function. This is indicated by an inhibition of adrenocorticotropic hormone release which occurs during cortisone administration. So far as is known, this appears to be a temporary effect; pituitary function returns to normal promptly after withdrawal of cortisone.

Experiences with Rheumatoid Arthritis

OUR experience with cortisone has included studies in numerous adults and children. In each instance these patients were suffering with severe rheumatoid arthritis. Following an initial period of treatment with cortisone, some patients have been allowed to relapse, others are continuing various clinical and metabolic studies.

We have followed the plan for dosage suggested by Hench and his colleagues, giving intramuscularly relatively large amounts on the first day or two to secure a decisive effect, and thereafter giving smaller uniform daily amounts. For adults initial amounts ranged from 150 to 300 milligrams. Subsequently daily doses have generally been 100 milligrams. In the case of children initial doses of 50 to 75 milligrams have been employed, and subsequent daily doses have been maintained at approximately one milligram for each kilogram of body weight.

Effects produced in these patients by cortisone may be summarized as follows: The first changes noted were subjective, lessening of sense of muscular stiffness and elevated mood. Psychic stimulation has often been intense, especially at the outset of treatment although in some no psychic stimulation was noted. Pain has been promptly relieved and appetite has increased. Patients have usually experienced moderate relief of joint swellings and tenderness, and have regularly noted improvement in function of affected joints.

Notable laboratory changes which resulted from treatment with cortisone included falling sedimentation rates, return to normal of inverted albumin-globulin ratios, and improvement of secondary anemia. In nearly every instance patients gained weight and appear to be in better health.

At the height of the cortisone effect, patients were in general obviously improved, but nevertheless disclosed many signs of the disease. Some joints remained thickened or slightly swollen, some remained tender. Evidences of old destructive osseous lesions were not altered.

Although marked clinical improvement has occurred in every instance, this has not always appeared with equal promptness. One patient, for example, noted definite improvement within an hour, another detected lessening of symptoms within five or six hours, and one observed no improvement until the morning following the first injection. In one particularly severe instance, no notable improvement was reported until eight or 10 days after the start of the cortisone injections. Not infrequently a distinct, even notable improvement has been recognized in regard to clinical findings before sedimentation rates have fallen.

When cortisone has been withdrawn symptoms generally have grown worse rapidly. Within 24 hours, subjective symptoms have been intense in some cases, and within a week or 10 days following such withdrawal, articular symptoms have sometimes been as severe as before administration of cortisone was started. Occasionally return of arthritis has been gradual, extending over several weeks, but this has been exceptional.

Toxicity: No symptoms have been observed by us which could be attributed to a toxic effect of cortisone although we have frequently observed effects of over-action of this hormone. Among these effects have been acne of face and trunk, mild degrees of pretibial edema, and subcutaneous ecchymoses. Striae and rounding of faces have occurred. We have not encountered osteoporosis or hypertension.

In one patient with mild diabetes controlled adequately by moderate dietary carbohydrate restrictions prior to cortisone administration, diabetes was aggravated by cortisone. Following a week's treatment a small amount of sugar appeared in the urine, and the fasting blood sugar, originally 140 milligrams per cent, had increased to 240 milligrams per cent. Within 24 hours following cessation of cortisone injections the

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level of fasting blood sugar returned to normal.

Comments on Availability of Cortisone: Inasmuch as artificial synthesis of cortisone is now possible, it is apparent that large supplies will eventually become available. Present-day methods of manufacture are based upon desoxycholic acid as a starting material. This substance derived only from animal bile is available only in limited quantities and must be treated by an elaborate and time-consuming process before cortisone is obtained. These important obstacles to production are responsible for a high cost at present but it is to be expected that these obstacles will be overcome and that the drug will be available at a moderate cost in the future.

Outlook for Cortisone Treatment: Although our studies have not progressed to a point where a final estimate of the worth of this treatment can be made, our outlook is indeed optimistic. At present a series of patients under our care are receiving cortisone in courses of two to three weeks followed by rest periods of three to seven days during which no cortisone is administered. It must be emphasized, however, that at least another year will be required before a more precise evaluation of the value of this procedure can be expected.

Adrenocorticotropic Hormone

COMMENTS ON CHEMICAL NATURE AND PHYSIOLOGIC EFFECTS: This hormone is a protein substance thus far found only in pituitary glands. Molecular weight of pituitary adrenocorticotropic hormone is reportedly close to 20,000; the isoelectric point is between 4.6 and 4.8.

Supplies which have been available to us have been derived from swine and horses Supplies of adrenocorticotropin have been made available to us through the courtesy of Dr. David Klein, Research Director, Wilson Laboratories, Chicago, and by Dr. Irwin Winter, Medical Director, C. D. Searle & Company, Chicago. Effects produced by products from both sources have been qualitatively identical although batches varied somewhat in potency.

Pituitary adrenocorticotropic hormone controls formation and release of hormones in the adrenal cortex through a mechanism similar to that involved in control of sex hormone production by the gonads, and of thyroxin production by the thyroid gland. Adrenocorticotropin is responsible also for maintaining the integrity of adrenal cortical cells. Studies of experimental animals have shown that withdrawal of adrenocorticotropic hormone is followed by atrophy and degeneration of the adrenal cortex. Administrations of excessive amounts cause enlargement or hypertrophy of the adrenal gland.

Pituitary adrenocorticotropin administration in normal individuals (and also in patients with rheumatoid arthritis) causes changes to appear which are attributable to a stimulation of many phases of adrenal cortical function. Retention of water, sodium, and chloride, together with increased excretion of potassium and phosphorus occurs, indicating a stimulation of electrolyte controlling factors. Excretion rate of 17-ketosteroids is increased, indicating accelerated production of androgenic hormones. Excretion of 11-oxysteroids and of uric acid is increased, indicating stimulation of production of cortisone-like hormones. In addition, decreased numbers of circulating eosinophils are found in the peripheral blood stream, indicating an effect which is as yet not understood.

Experiences with Rheumatoid Arthritis

NUMEROUS patients with rheumatoid arthritis have been treated by us with adrenocorticotropin during recent months. These studies have been continued in some instances up to one year. Doses employed have been altered from time to time, depending upon the potency of individual batches. Generally, effective amounts for adults ranged between 40 and 100 milligrams daily.

A remission of symptoms has been observed in every patient to whom the active compound has been administered. Pain has lessened and functioning of joints has been improved. In general it can be stated that remissions produced by means of adrenocorticotropin have been qualitatively identical to those observed following cortisone administration. Treatment of individuals with rheumatoid arthritis of moderate severity and little osseous destruction resulted in marked improvement. Patients who showed severe articular destruction at the start of treatment experienced marked subjective relief from stiffness and pain, but generally remained disabled by residual deformities. Withdrawal of adrenocorticotropin has been followed in every instance by a rapid return of symptoms.

Adrenocorticotropin derived from horse pituitaries possessed a degree of clinical effectiveness against rheumatoid arthritis similar to that of the material obtained from swine. Symptoms improved promptly following administration of material from either source.

"Toxic" Effects: Little evidence of toxicity was observed from adrenocorticotropin administration. Some patients experienced painful indurations at the sites of injections. but these did not suppurate. Early in the work, some of the material contained notable amounts of pituitrin which induced abdominal griping and peristalsis, but more recently products from both swine and horse pituitaries have been relatively free from this contaminant.

In several female patients, slight rounding of the face and varying degrees of pretibial edema were observed following adrenocorticotropic hormone therapy. Following withdrawal of the hormone this cleared rapidly.

In one patient, an amount of adrenocorticotropin which was effective in controlling articular symptoms caused severe acne to appear. In another patient an amount of adrenocorticotropin which maintained the joints in a reasonable

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state of comfort caused acne and subcutaneous bruising to appear.

Comments on Availability: Although adrenocorticotropin possesses remarkable ability to induce remissions in rheumatoid arthritis it is doubtful that this compound can be produced in quantities sufficient for treatment of the several million persons in this country who are suffering from rheumatoid arthritis. Pituitaries derived from swine can yield an amount sufficient only for limited manufacture, enough perhaps for treatment of a few thousand patients. The number of horse pituitaries which could become available for this purpose is even smaller than the number which could be obtained from swine. Thus it would appear that adrenocorticotropin may prove most useful as a research tool with which to study the means by which hormones influence disease states.

Other Adrenal Steroids

WHEN cortisone and adrenocorticotropin were available in only small amounts it was hoped that other substances more readily available would be found to induce similar remissions in rheumatoid arthritis. We have tested eight steroid compounds in addition to cortisone. These included pregnene-triolene, progesterone, 17-alphahydroxy progesterone, 17-hydroxy corticosterone (Compound S of Reichstein), desoxy-corticosterone, testosterone, delta-5-pregnenolene and 21-acetoxy-pregnenolone.

These experiments were similar to experiments employed by us in dealing with cortisone and adrenocorticotropin. Patients were first observed during preliminary control periods. Thereafter the compounds were administered for periods of two or three weeks. With each compound excepting desoxy-corticosterone we carried out at least two experiments using daily loses of 100 milligrams in one, and 200 milligrams in another. With desoxy-corticosterone, 50 milligrams daily were administered in one instance for a week; in a second instance, the daily dose was 75 milligrams. We observed no recognizable improvement in the condition of any patients during these experiments and saw no improvement of blood counts, hemoglobin values, abnormal serum proteins or sedimentation rates.

Hench and his colleagues have examined Kendall's Compound A and reported negative observations. Their trials with Kendall's Compound F have, however, yielded results which indicate that this compound possesses anti-rheumatic activity of an order similar to that of Compound E.

Cortisone and ACTH in Rheumatoid Arthritis

MY COLLEAGUES and I have attempted to discover the mechanism by which these compounds produce their anti-rheumatic effect, as it is our conviction that discovery of this mechanism may lead to a better understanding of the nature of rheumatoid arthritis and perhaps to further improvement in therapy.

Our studies have thus far confirmed the impressions already recorded by Hench and his colleagues that patients with rheumatoid arthritis show no deficiency of adrenal cortical function. Our studies on patients with rheumatoid arthritis have demonstrated metabolic effects from cortisone and adrenocorticotropin similar to effects observed in normal, non-arthritic individuals. Our studies have failed to produce evidence of an increased destruction of cortisone in patients with rheumatoid arthritis as compared to the normal individuals. In brief, the mechanism whereby these hormones produce their anti-rheumatic activity is still unknown.

Conclusions

CORTISONE and adrenocorticotropin possess similar powers to reverse the course of rheumatoid arthritis. Adrenocorticotropin probably acts by stimulating an autogenous production of cortisone. Cortisone, pituitary adrenocorticotropin, and Compound F are the only substances thus far proved to possess this anti-rheumatic effect.

Toxic effects resulting from cortisone and adrenocorticotropin were not frequently encountered so long as these compounds were administered with due regard for their physiologic effects.

(109 N. Wabash.)

Occupational Cancer

WORKERS frequently know the hazards of their occupation long before their employers recognize or accept them. Often it is not until repeated calamities have occurred that a plant is investigated for possible hazards. Although the employees have learned by bitter experience or from the suffering of fellow employees the dangers of the work, often the employers will blindly refuse to face the issue and attempt to deny their responsibility. All dermatologists should realize the possibility that occupational cutaneous cancer, although rare, can and does exist.... Precautionary measures used in any big plant are the same as should be used in all plants where there is any hazard which would cause dermatitis or any other untoward reaction of the skin.

—From an article by JOHN G. DOWNING, M.D., Boston dermatologist, in *J.A.M.A.*, January 26, 1952.

Carcinogenic Studies on Isopropyl-N-Phenyl-Carbamate

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ISOPROPYL-N-PHENYL-CARBAMATE was previously studied by Dustin[1] in connection with an investigation of the antileukemic action of ethyl carbamate and other carbamic esters upon leukemic mice. He noted that there was, eight hours after the injection of 0.5 gm./kg. of this chemical, a decrease in the number of mitoses in the intestinal mucosa, which, however, was not followed by any marked nuclear destruction. Toxic changes were absent in C57 mice after the daily ingestion of 28 mg. of this chemical incorporated in the food. Larsen[2] in unpublished experiments found that, in contrast to ethyl carbamate, isopropyl-n-phenyl-carbamate does not enhance the liability of strain A mice to tumors of the lung. Additional observations on the biologic and antileukemic properties of isopropyl-n-phenyl carbamate were reported by several English investigators.[3]

Isopropyl-n-phenyl-carbamate is of distinct interest from a carcinogenic viewpoint not only because it is a carbamic ester, but also because it may decompose through acid hydrolysis into aniline, isopropyl alcohol and carbon dioxide. It is still controversial whether or not the industrial production of aniline is associated with a bladder cancer hazard. Definite suspicion exists that the manufacture of isopropyl alcohol is causally related to the appearance of cancer of the respiratory organs (nasal sinus, larynx, lung) through the development of some unknown carcinogen in the crude liquor.

Since the manufacturer of this chemical, the Pittsburgh Plate Glass Company, wanted to market isopropyl-n-phenyl-carbamate as a weed killer to be applied in dust form, the possibility of appreciable exposure to it by inhalation, ingestion and skin contact exists for producers and users as well as for members of the general population living or working in areas where this chemical may be employed.

Experimental Procedure

THE experiments set up in this investigation were in the nature of a screening operation for potential carcinogenic properties, that may became manifest after prolonged and considerable contact to isopropyl-n-phenyl-carbamate administered by various routes. Since the experiments of Larsen had rendered information on the possibility of lung cancer hazards, the main attention in designing this investigation was given to obtaining data regarding carcinogenic effects upon other organs and tissues.

Four sets of animals and two species, mice and rats, were used. The rats were of mixed breed (Osborn-Mendel strain interbred with a congenitally hairless strain). The mice, males and females, belonged to strains A and C.

1. CHRONIC ORAL ADMINISTRATION: 160 mice (three months old); 15 rats (eight months old).

Rat Diet: 2% I.P.C. was incorporated into powdered Purina Chow which was mixed with a small amount of salad oil (Mazola) for binding purposes. This material was dried, cut into cubes and placed into the usual feed hoppers. The rats were permitted to eat ad libitum.

Mouse Diet: A similar diet containing 2% of I.P.C. was prepared for the mice. Since the entire set of 30 mice died within three weeks after the start of the experiment, a new group of mice consisting of 15 males of strain C and 15 females of strain A was used, and the content of I.P.C. was reduced to 1% by weight. Because the mortality among the mice remained high, a new group of 25 males of strain C and of 25 females of the same strain was set up six weeks after the start of the experiment (December 8, 1949). The amount of I.P.C. given to these animals was again decreased to 0.5%. A fourth group of mice was introduced into the experiment again consisting of 50 mice about three months after the start of the investigation and the I.P.C. content was dropped to 0.1% at which level it remained for all surviving animals until the end of the experiment. There were thus 160 mice in this experiment.

The rats tolerated the diet fairly well. They were alternately placed from one to two months on the I.P.C. diet followed by one to two weeks on a normal diet. The mice, on the other hand, became readily emaciated, lost appetite and showed a high death rate, unless they were taken off the experimental diet every two weeks and placed on a normal diet for an equal period. This routine was developed after some experimentation with different I.P.C. concentrations and intervals conducted during the first four months of the experimental period. The final radical change in concentration of I.P.C. in the diet and the intermittent feeding schedule was made when the mice given a diet containing 0.5% I.P.C. developed extensive loss of hair. When returned to a normal diet the hair growth reappeared promptly and the mice assumed again normal appearance some four weeks later. The mice exhibited extensive cannibalistic tendencies, 17 being lost from the series in this manner.

The last animals in both groups surviving for about 18 months were sacrificed.

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MORTALITY TABLES OF RATS AND MICE OF THE ORAL FEEDING GROUPS

I. *Rats*

Months:	1	7	9	10	15	18	
Deaths:	2	1	1	1	2	8*	sacrificed

Autopsy examinations performed on all rats showed an absence of tumors or abnormalities grossly suggesting the possible presence of preneoplastic changes. The histologic examination of the heart, aorta, lung, stomach, intestine, spleen, liver, pancreas, kidney, adrenal, bladder, testis, sternum, of six long-term survivors did not reveal any pathologic changes that can be attributed to the presence of isopropyl-n-phenylcarbamate in the diet.

II. *Mice*

Months: Series	1	2	3	4	5	6	7	8	9	10	11	12-18 above	Dose % IPC
I	30												2
II	14	11			1	4							1
III	7	10		1		2	3		1	1	6	16	0.5
IV	1			1	8	5			8	5	6	2	0.1
	52	21		2	9	11	3		9	6	12	18	

Autopsy examinations revealed that the mice were emaciated and had hyperemic or hemorrhagic lungs. Generalized decrease of hairy coat was apparent in mice belonging to series II. Small grayish white pin-head sized nodules were found in the lungs of two mice of series III dying nine and 12 months, respectively, after the start of the experiment. The spleens were found to be considerably enlarged in several animals that were sacrificed at the end of the experimental period of 18 months or which died during the last third of the experimental period. Bladder, liver, stomach and intestine were always without any gross pathologic changes.

It is apparent from these observations that I.P.C., given orally in doses mildly to moderately toxic, over a period of up to 18 months did not cause the development of benign or malignant tumors in any organ, especially not in the lungs, bladder, liver or gastro-intestinal tract.

2. REPEATED INTRAMUSCULAR ADMINISTRATION.

In this experiment 15 female Osborne-Mendel mixed breed rats and 60 strain C mice (30 males, 30 females) were used. The rats were approximately six months old and the mice were about five months old at the start of the experiment. The rats and mice were injected into the right femoral muscle with a suspension of I.P.C. in lanolin. The dose given was 40 mg. of I.P.C. per 100 gm. of body weight. This was administered in a total mass of 0.2 cc. per individual dose. The rats received this amount once a month, while the mice were injected with 0.1 cc. once every two weeks. The injections were continued over a period of up to six months. The last surviving animals of both sets were sacrificed at the end of a total experimental period of 18 months.

The injections were tolerated by members of both species without any definite reactive symptoms. It was noted during the course of the experiment that a large part of the injected material was retained at the site of injection in the form of large white creamy encapsulated masses. The surrounding muscle tissue did not reveal any definite reactive changes demonstrable on gross inspection. Some of the mice developed moderate loss of hair, especially around the heads and involving the right thigh.

I. *Rat Series:* One rat developed a golf-ball-sized well encapsulated tumor located in the left inguinal region and showing on the cut surface the characteristic nodular structure of an adenofibroma. Cannibalism was extensively practiced. For this reason, autopsies were available on only 10 rats.

Postmortem examinations showed that there was no significant change in the three rats that died within the first 14 months of the experiment except the presence of white encapsulated masses in the right femoral muscle and congestion of the lungs. The seven rats that died or were sacrificed during the last four months, on the other hand, revealed several abnormalities. In one rat, the left lung was transformed into a firm white cystic mass, while the right lung was studded with up to pea-sized white nodular masses. The uterus showed an acorn-sized dark red well-encapsulated, nodular mass. A walnut-sized firm mass surrounded by edematous tissue was present in the uterine fundus of a second rat. The tumor showed a fibrillar structure on the cut surface and was well circumscribed. The right upper lobe of a third rat was replaced by a firm white homogeneous mass, while a pea-sized cyst with clear watery content was present in the cortex of the left kidney, a rice-grain-sized dark node was found in the left uterine horn and a considerably enlarged adrenal gland was discovered in the fourth rat. A fifth rat had a firm, encapsulated tumor measuring 3.5 x 4.5 x 2 cm. located in the left groin, which showed on the cut surface the lobulated pattern of an adenofibroma.

The histologic examination of the organs of nine rats of this group showed the following findings:

The extensive pulmonary changes observed in one rat were of chronic inflammatory nature and were associated with the formation of large cystic cavities lined by an inflammatory fibrous wall and filled with pus. The branches of the pulmonary artery revealed in one rat, large bony plates with small marrow cavities located in the media. The uterine tumor was an adenomyoma. A similar cystic node attached to the uterus of a second was of similar nature. The glandular structures, however, were often cystically distended and lined in part by a stratified squamous epithelium. The skeleton muscle of the right thigh contained at the site of injection, smaller and larger foci of foam cells and cysts located

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in the interstitial tissue. The muscle tissue was essentially normal. The tumor located in the groin of one rat was composed of multicystic glandular formations with papillary excrescences. In some parts the glands were solid structures and the cuboidal cells seemed to infiltrate the surrounding cellular stroma consisting of oval to spindle-shaped cells. Similar solid hyperchromatic glandular structures were found in the lung invading the peribronchial lymphatics. The enlarged adrenal found in one of the rats was caused by a central necrosis of the medulla followed by a hemorrhage.

The evidence presented indicates that I.P.C. did not cause any tumor formation at the site of injection, where merely inflammatory foam cell granulomas were found. The adenomyomas of the uterus present in two rats of this series and the adenocarcinoma of the breast noted in a third rat do not seem to have any causal relation to the chemical administered, because similar reactions have been observed among control animals. The chronic inflammatory pulmonary manifestations, likewise, must be considered as coincidental findings, since such lesions are not uncommon in rats subjected to various experimental procedures as well as in rats belonging to control stocks.

II. *Mouse Series:*

MORTALITY TABLE OF MICE GIVEN REPEATED INJECTIONS OF I.P.C. INTO THE THIGH

Months	1	2	3	4	5	6	7	8	9	10	11	12	13-18
Females	3	3	1	1	3					2	2	5	15
Males	3	6	4	3	3		3	1	5	2	5	1	3
Total	6	9	5	4	6		3	1	5	4	7	6	18

It is apparent from these data that female mice apparently tolerated the injections of I.P.C. better than males. The postmortem examinations showed large white encapsulated creamy masses which in some animals extended into the retroperitoneal tissue. The lungs were often hyperemic and sometimes hemorrhagic. White nodular masses of pin-head to split-pea size were found in the lungs of six mice among a total of 74 examined. There was no evidence of any neoplastic reaction in any one of the mice examined.

The general conclusion, therefore, can be drawn that the repeated intramuscular injection of large doses of I.P.C. into mice and rats did not result in the development of tumors within an observation period of 18 months.

3. REPEATED INTRAPLEURAL ADMINISTRATION.

In this experiment, 15 male rats of a mixed Osborne-Mendel strain about five months old, and 60 mice of strain C (30 males and 30 females) were used. The doses of I.P.C., the vehicle as well as the amounts and procedure and intervals of administration, were identical with those used in the intramuscular experiment with the exception that the material was injected through the supraclavicular fossa into the right pleural cavity. It was noted that some five to six mice of the series reacted upon the injection with a rapidly developing state of shock which lasted about one hour. The total duration of the experiment was 18 months. Injections were stopped after six months. There was no loss of hair among the animals of this experiment.

I. *Rat Series:* Autopsies were performed on nine rats. Six of these animals died during the first 14 months of the experiment, while three died or were sacrificed during the last four months. In all animals the right lung was adherent to the thoracical wall and was partially collapsed or compressed by the pleural exudate and deposit. The right lung was often hyperemic and contained, in three instances, small nodules or cysts of whitish or yellow soft material. In two instances, an edematous and fibrinous inflammatory reaction product was found in the mediastinum and in the left pleural cavity. The abdominal organs were normal. The testes of one rat were small and soft. The lungs showed chronic pleuritic and pneumonic changes. There were frequently abscesses present in the lung. The pulmonary arteries of several rats showed extensive medical calcifications. Except as to some hyperemic and degenerative changes in some of the animals there were no pertinent pathologic findings. Tumors of any kind were absent.

II. *Mouse Series:*

MORTALITY TABLE OF MICE GIVEN REPEATED INJECTIONS OF I.P.C. INTO THE THIGH

Months	1	2	3	4	5	6	7	8	9	10	11	12	13-18
Males	9	7	3	1		2	1	3	4	8		3	
Females	6	3	3	2	1	1	2	4		1		1	9

As in the intramuscular group, female mice seem to have a higher resistance to I.P.C. than male mice as indicated by the survival rates.

The postmortem examinations showed the presence of white to yellow creamy encapsulated masses in the pectoral muscle and similar material in the right and sometimes in both pleural cavities. The lungs were hyperemic, and the right lung was often compressed by the intrapleural deposit and exudate. Apart from occasional congestive and inflammatory reactions in the abdominal organs, no other pathologic lesions were noted. White nodular masses in the lungs existed in two female mice. There was no evidence of tumor formation in any of the internal organs or at the site of injection.

4. CONTROLS.

Thirteen female rats of a mixed Osborne-Mendel breed, about five months old, and 55 male mice, strain C, about seven months old, were used as controls.

Ten rats survived the entire experimental period of 18 months. There were no abnormalities present in this series with the exception of an adenoma of the breast in one rat.

The first series of control mice, numbering 30

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animals, died within four months. Of the 25 animals composing the second set of control mice, five died during the first six months, 12 died during the following period of six months, and the surviving mice died or were sacrificed during the third period of six months. Apart from the presence of a few small greyish white spots in the lungs of two mice, and frequent congestive pulmonary reactions, no significant pathologic changes were found.

Comments and Conclusions

THE observations made in the different experiments in mice and rats support the negative results reported by Larsen as to the carcinogenic potency of isopropyl-n-phenyl-carbamate. The doses given were close to the chronic tolerance dose. The observation time covered the average life span of mice and the greater part of the life span of rats. The chemical, moreover, was administered by three different routes, two of which resulted in the production of depots. Since it is most unlikely that the two tumors of the uterus and the cancer of the breast found in three rats belonging to the series given I.P.C. intramuscularly are causally related to the chemical, the conclusion can be drawn that under the conditions of the experiments performed, I.P.C. has not shown any carcinogenic potency. It must be pointed out, however, that the existence of species specific differences in the reactivity of different species to carcinogenic chemicals does not permit an unequivocal answer to the question, whether a carcinogenic reaction to IPC in man has entirely been excluded.

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The Fellows of the Institute of Industrial Health, University of Cincinnati College of Medicine, were guests of Eli Lilly and Company, Indianapolis, Indiana, on December 5 and 6, 1951. During their visit they inspected the Lilly Laboratories. This group picture, at the entrance to the Research Laboratories, includes (Front, left to right): Dr. John J. Phair, Miss Ruth Schoenling, Mrs. Lee H. Miller, Miss Helen Plagge, Mrs. John J. Phair, Dr. F. B. Lanahan, Dr. Charles W. Asbury, Dr. Klaus Dror; (Rear, left to right): Dr. Charles W. Kraul, Mrs. Charles W. Kraul, Dr. John C. Duffy, Dr. Philip Boyd, Dr. Lee H. Miller, Mrs. George Voelz, Dr. George Voelz, Mr. C. A. Kothman.

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The Cardiac in Industry: A Symposium

THIS Symposium has been arranged by the Committee on Clinics and the Committee on Cardiovascular Diseases in Industry of the New York Heart Association for the purpose of presenting the problems of the cardiac in industry, and the part that the Heart Association is playing in making it possible for the patient with heart disease to earn his own living without jeopardizing his health. It has been arranged also for the purpose of explaining the activities of the Work Classification Unit of the Adult Cardiac Clinic of the Third Medical Division at Bellevue Hospital and the plans to expand the activities of this unit to the member clinics of the Association.

The whole story of the cardiac in industry is closely tied in with the history of the New York Heart Association itself. Actually, the story began 40 years ago in 1911. At the time there were many cardiac patients in Bellevue Hospital, as there are now. They received adequate care while in the hospital but once they were discharged supervision was almost non-existent, with the result that the Social Service Department was always overwhelmed with the social, financial and medical problems of the recently discharged cardiac patient. Miss Mary E. Wadley, head of the department at the time, saw a need not only for convalescent care but also for assistance to these patients in their search for suitable employment. She knew, too, that attendance at a clinic in the daytime and holding a job were not compatible. She convinced a group of physicians of these truths, and the first cardiac clinic was started largely as an experiment in that year of 1911 under the direction of Dr. Hubert V. Guile. It has continued to meet once a week over the 40 years elapsed since that time.

To give emphasis to its principal function the clinic was originally called the Bellevue Hospital Social Service Cardiac Clinic for Working Adults. It is now known as the Third Medical Division Adult Cardiac Clinic of Bellevue Hospital. Originally the clinic met on Friday nights so that if a patient gradually developed manifestations of failure during the week it would be possible for him to go to bed over the week-end and return to work on Monday morning. More recently the clinic has been held on Thursday nights.

In 1915, Dr. Guile and a group of other physicians in New York, moved by the plight of the indigent cardiac, thought it desirable to expand the good work of the first cardiac clinic, and toward this end founded an organization which was called "The Association for the Prevention and Relief of Heart Diseases." The early activities of this Association were greatly hampered by the entry of the United States into World War I. Nevertheless, it was instrumental in creating still another organization called the Association of Cardiac Clinics in 1917. Later the new association became part of the parent association and its name was changed to the Committee on Cardiac Clinics. Meanwhile, the parent association changed its name to the New York Heart Committee and in 1926 attached itself to the New York Tuberculosis and Health Association. In 1945 it became an independent organization which became known as the New York Heart Association.

These data may seem far away from the problem of the cardiac in industry but the truth is that the whole movement arose from endeavors to make the indigent cardiac patient economically independent by keeping him on a job. In 1941, in the same cardiac clinic that was originally founded in 1911 for the "working adult," a new unit was started by Dr. Goldwater with the added purpose of attempting to fit the physical capacity of the cardiac patient to a job for which he otherwise met training and experience requirements. To accomplish this the Work Classification Unit was begun, and it had in addition another function—to study the effect of industry on the course of heart disease. The early efforts of this unit were marred by the beginning of World War II, and in 1942 it had to be disbanded because the majority of its personnel went into military service. Meanwhile, the war-engendered manpower shortage gave emphasis to the importance of the handicapped worker in industry, and in 1946 the Unit was started again. In the interim the War Manpower Commission in collaboration with the Federal Security Agency, the U.S. Public Health Service and the Employment Services of several states and various industries gathered some useful data on means of serving the handicapped in competitive employment. The result of this collaboration was the creation of the "Selective Placement Plan." The Plan, which is now quite well-known, provided for an analysis of all jobs in an industry, appraisal of the physical capacities of workers in like terms, and placement by matching the physical capacities of the individual with the demands of the job. In the decade since it was begun a great deal has been learned in the Work Classification Unit, and now some of this newest knowledge will be imparted by the speakers.

—CHARLES E. KOSSMANN, M.D.,
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New York University.

This Symposium was presented to a group of physicians connected with the cardiac clinics affiliated with the New York Heart Association at a group conference in 1951.

Estimating the Work Capacity of the Cardiac

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IT CAN be stated more or less categorically that at the present time there is no single test or combination of tests which can be used in providing an objective measurement of work capacity of the cardiac. In spite of this, it is possible to arrive at a reasonable estimate of work capacity through the use of collateral evidence. Some of the factors which enter into final assessment will be mentioned and briefly discussed. Interdependence of many of the factors is, of course, obvious.

1. *Age.* Generally speaking, work capacity, particularly when physical exertion is involved, tends to decrease with increasing age. In evaluating capacity, therefore, the standard should be that of the

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particular age group involved rather than that of a younger or older group. Work capacity must not be confused with employability since age itself, even in the absence of cardiac or other physical limitation, is a major factor in employability.

2. *Previous Occupational Activity.* The fact that a person has recently performed a particular type of occupational activity and has done so without any signs of taxing the cardiovascular system is the strongest evidence that the work involved is within the physical capacity of the individual. Because of familiarity with a job as a result of previous experience, acceptability of the work is often enhanced, thus contributing to work capacity.

3. *Etiology of the Heart Disease.* In a large proportion of cases, this factor is closely related to age, since most cases of rheumatic etiology will be in the younger age groups while the degenerative etiologies (hypertension and arteriosclerosis) are found among older persons. In the evaluation of work capacity, etiology is of importance only indirectly, first as has been mentioned, because of its association with age, and second because of its relationship to the nature of the pathological process in the heart. If an etiological factor is likely to be aggravated or re-activated by a particular type of occupation, as in the case of a hypertensive involved in work requiring speed, or a rheumatic in a wet, cold or drafty environment, the etiology becomes a factor in the evaluation of work capacity.

4. *Signs and Symptoms of Diminished Cardiac Reserve Resulting from Everyday Activities.* Helpful information pertaining to work capacity can be obtained by inquiring into (a) shortness of breath on climbing stairs, (b) fatigue on walking, (c) swelling of the ankles, (d) number of pillows used in sleeping, and (e) general reaction to ordinary activity. The time and manner of onset of any abnormal symptoms, their severity and progression are features which enter into the evaluation. It is important to remember that many persons who are aware of their heart disease restrict their ordinary activities to such an extent that it becomes difficult or impossible to evaluate their reaction to exertion. If it should be possible to observe an individual while actually performing various occupational or non-occupational activities, valuable information might be obtained.

5. *Nature of Pathological Changes in the Heart and Vascular System.* It is quite obvious that in the estimation of work capacity, one must take into consideration such factors as (a) valvular damage, (b) myocardial infarction, (c) congenital defects, (d) myocardial hypertrophy, (e) arterial (particularly coronary) sclerosis or atheromatosis, (f) endocardial vegetation, (g) abnormalities of the pericardium, and (h) congenital defects. The fact is well known that many persons who have severe valvular damage due to rheumatic fever, and particularly those who have never been in congestive failure, can perform considerable amounts of physical exertion without detrimental effects. On the other hand, myocardial infarction, particularly of recent occurrence, calls for severe limitations, even when objective evidence of structural abnormality is minimal.

6. *Blood Pressure.* While elevated blood pressure is, of itself, rarely a disabling factor, the possibility of further elevation and of some type of vascular insult leads one to impose limitations on the hypertensive subject. Strictly speaking a person who has hypertension without enlargement of the heart or without evidence of concomitant vascular disease (coronary or aortic) cannot be said to have heart disease. Nevertheless potential heart disease can be said to exist, and this is sufficient to constitute a reason for limiting certain types of occupational activity. The constant danger of a cerebrovascular accident is another limiting factor for the hypertensive.

7. *Disturbances in Rhythm.* As a general rule, irregularities of rhythm or impairments of the conduction mechanism are found in conjunction with pathological processes in the myocardium. Other things being equal, the presence of a disturbance in rhythm constitutes an additional limiting factor.

8. *Chronology of Previous Cardiac Episodes.* Rheumatic activity, congestive failure and coronary thrombosis are the principal cardiac episodes that enter into the evaluation of work capacity. The number of such attacks (or their absence) their recentness or remoteness and their duration and severity are the major characteristics.

9. *Use of Medication.* The necessity for using digitalis, vasodilators, diuretics, sedatives, or special diets for the relief or control of symptoms is obviously one of the considerations in evaluating work capacity.

10. *Body Build.* This factor is obvious and needs no further discussion.

11. *Emotional Status.* An entire dissertation could be written on the subject of fear and anxiety as a disabling factor in persons who have, or think they have, heart disease. Not infrequently the emotional status contributes to limitation of activity to a greater extent than the cardiac lesion. The limitation attributable to fear and anxiety is usually, but not always, self imposed, and constitutes a major complication when it comes to the estimation of work capacity. Motivation is another important emotional factor in the evaluation.

12. *Non-cardiac Disabling Factors.* A considerable number of persons with heart disease are found also to have additional unrelated diseases. If, as is sometimes the case, the non-cardiac disease is one which of itself imposes severe limitations of physical activity, the problem of evaluating work capacity from the point of view of heart disease is simplified. On the other hand, the presence of a second disease may make the problem more complicated, as in the case of superimposed pulmonary pathology.

The list of points given above, possibly incomplete, might convey the impression that estimation of work capacity is a hopelessly complicated process. This is not the case, since an experienced observer, in viewing the whole patient, automatically or unconsciously takes notes of these factors. There might be a temptation to set up some arbitrary formula, assigning a certain number of points to various gradations in each category, thereby arriving at an evaluation. Such a procedure would almost certainly lead to serious error. In estimating work capacity, as in other fields of medicine, there is probably no substitute for clinical judgment based on careful observation and experience.

Expressing Work Capacity

UNLESS the evaluation of work capacity can be expressed in terms which can be translated into a plan of work, the evaluation is largely of academic interest. Perhaps the earliest attempt in

this direction was that of the New York Heart Association in its Functional and Therapeutic Classification. More recently the War Manpower Commission during World War II developed a form for recording physical capacities, applicable to all types of physical impairment. A modified version of the latter, used in conjunction with the former, has been in use at the Bellevue Hospital Work Classification Unit for several years. Although this method of reporting leaves much to be desired, it appears to provide the information required by placement counsellors.

Responsibility of the Medical Social Worker

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THE responsibility of society for its members and the spirit of service to the ill and handicapped are centuries old. However, within the last century, we have found assistance given not only to the physical and spiritual needs of the patient but, through social case work, a younger professional service, to other areas of need which affect the health and welfare of the patient and of society in general.

Let us look at how this new profession offers its service to the particular patient group, the cardiacs of employable age. Realizing, as we must, its high incidence in persons of working age, how does the medical social worker contribute to making the cardiac better able to meet normal living and industrial demands in our society?

In the first place, what is the meaning of heart disease to the average lay person? It is important to consider this, for it represents the usual picture of heart disease which the patient has formed over a long period of time and it conditions his known attitude toward illness.

To the man on the street the cardiac is an invalid not able to climb stairs, nor to walk, nor to do any work. Hearing of sudden and unexplained death, the common response is, "He must have had a heart attack." In brief, he is pre-conditioned to fear, to the idea of severity of heart disease and of associated great restrictions. If we add to this an experience of the meaning of heart disease in a parent or a brother or sister, there is double emotional significance to the illness.

Hospital care, physical pain and discomfort, heavy expense, loss of compensation from work are all part of the picture. The family group, filled with anxiety which is readily translated to him, is also there. Most important in this first illness is the interpretation of its meaning by the physican. The patient must not get out of bed for a while; he must conserve all his energies toward getting well; he must allow others to wait on him. At the time of hospital discharge, he is told to take it easy for a while; to come back to the clinic for check-ups. Usually he is told the awful truth of his heart condition, and is advised that with proper care he can live comfortably. However, there are few patients who can accept this information without some difficulty, and, according to their basic personality structure, they are apt to become over-anxious about their own future health or else they need to face and, in a sense, deny the threat that it brings.

In the clinic patient we have much the same reaction. Illness and disability may be less acute, but they are there. Again in the clinic there is the patient's discovery of his illness and his understanding and acceptance of what it means. This is not the illness for which one gets one or several prescriptions leading to cure and discharge. Rather, importance of frequent and regular check-ups is stressed and follow-up letters are sent if the patient fails to appear. Repeat x-rays and EKG's raise the question "Am I getting worse—the doctor wants another test." The "clinic club" allows time enough for the patient to learn all about other manifestations of heart disease. True, some of these are externals, but they frequently add up to the same sum of fear and tension that is more traumatically experienced by the acutely ill patient.

How can the medical social worker help these patients with their adjustment? The medical social worker can get to know the patient, to talk with him about what her function is in the hospital, and to show him that she is interested in him. There are several elements that can be explored with the patient at this point which can be the basis of rehabilitation planning at a later date. First, and perhaps easiest, are the patient's understanding and feelings about his illness. Not just what the doctor told him but how he relates this information to his life, what his family understands, and how they have used the information. It is surprising the meaning the patient can take out of the doctor's statements to him; surprising too, the questions he forgets to ask during the examination which he will voice later to the social worker. Through interpretation of patient reaction to the physician, a great service can be rendered the patient in that he can come to a more accurate and more acceptable understanding of his illness. Too, the social worker can begin to understand the family pattern and to carry the doctor's interpretation over to the family members and help them in the formation of acceptable attitudes toward the patient.

Beyond the patient's emotional reaction to illness, there is a great need to understand the actual social environment from which he comes. Is this person the head of the house responsible for both his own and the family support? What is the meaning of unemployment to him, if unemployment is necessary? How can he be helped better to understand, and either to adjust himself in or change his home environment? What are family attitudes toward the patient before illness and during illness? How does the patient react to his family? How can family relationships be strengthened so that lessened earning capacity will not be more harmful than actual strain of work?

If there is financial strain, either because of the patient's disability or concurrent with it, the social worker must plan for community help to ease the strain, and she must help the patient to use it. On a purely social level does this patient know how to relax and find enjoyment in living? So many of the cardiacs we now meet are accustomed only to long years of work with little pleasure, until for them work becomes a social outlet.

On the vocational level the case worker can begin to study what meaning this illness may have to the patient as a working person. What did the patient do before his illness, or what is his current occupation, and, of almost equal importance, how

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much of himself emotionally did the patient invest in his work? I am sure we all know the patient who tells us he has a sedentary office job, but who is the compulsive type of worker, driven to overexertion over every detail. For this kind of worker there is no light job until he can understand and, if possible, change his behavior to a marked degree. Such a worker will benefit not at all by being told that he must slow down. Only by finding satisfactions outside his work and careful placement in a job where his detail-mindedness can be an asset with a normal work picture can there be any immediate relief. Beyond this, more intensive methods aimed at change in personality can be considered.

In understanding the patient's vocational picture, it is important to look critically at the information secured. The element of fear about being able to compete normally may induce him to place a somewhat false interpretation on facts. Therefore, in the vocational area, it is important to understand the actual meaning of work pressures if such information is available.

However, most important in the service the social worker gives will be her understanding of the meaning of the medical. Beyond the medical chart, the social worker must learn from the doctor the true meaning and extent of the illness. This medical information, plus her social information, equals her degree of understanding of the patients' needs.

The meaning of coronary heart disease to a longshoreman and to a bank clerk is very different. The stresses and pressures of the two occupations differ to such a degree that the identical physical condition would indicate different planning for the two patients. The social worker is in the strategic position of gathering all the facts that make such planning possible. However no one can expect the medical social worker to be all things to the patient. She must use all the services of the community skillfully if her patient is to receive the maximum of assistance, and to do this means to be able to make sound referrals to other agencies.

Unhappily we all must face the limitations in the community. A part-time job at a good salary, for a 64 year old ex-taxi-driver, may be an ideal medical social plan but it is an Utopia which New York cannot provide.

However, industrial experiences can have a very real meaning in working with the cardiac patient—real to the patient and helpful to the physician in terms of testing just what the patient's capacities are. For the last six and a half years our agency has been operating on a policy which permits acceptance of any type of handicap for service in its Handicapped Department. We have served about 75 cardiacs in that time. Although the number is small, perhaps there is enough common in their experience with us to be helpful in the broad understanding of the cardiac patient's needs. Operating sheltered workshops we have a simulated work situation where the patient can have normal work experiences without the emotional pressure of industrial employment. From the moment he first comes to us, he is helped to understand that his welfare is the only important thing in the workshop. A case worker is the first to see him and to talk about what he needs. A clearance of medical information and a study of the patient's reaction to his illness follow. Planning comes after this and incorporates both the physical and the emotional needs of the client.

In the rehabilitation of the cardiac patient, there is the need to establish a probable level of rehabilitation. Depending on the severity of the heart disease, the intellectual capacity of the patient, his age, his emotional concept of his illness, and the labor market, he can expect complete return to industry, partial employability through sheltered shops, or limited industrial placement, or possibly home employment. In many ways he himself is the measure of how far he can go. Many patients start with the feeling that industry is closed to them.

It is not every cardiac patient who can expect to get back to normal industry. For many the prognosis is poor, for instance, as to some of the adult rheumatic patients whose lives have been a long series of recurrent attacks and who seem to lose ground slowly with each reactivation. The medical social worker's role is then primarily one of helping the cardiac to accept limitations and to derive satisfactions in other areas of work.

Throughout the entire contact with the patient, there are two constants, which seem necessary in helping the cardiac back to industry. First is continued medical supervision, which gives him the green light to move ahead as he is ready for it. And second is the social worker's care, which gives understanding and support, and helps with the simple everyday problems as well as with the deeper emotional needs of the patient.

As we work with cardiacs more and more, we become aware that employment is no longer closed to them. However, we are made aware, frequently, of the lack of industrial facilities for the rehabilitated cardiac worker. It is our hope that the knowledge we are gaining through typical work situations and through the efforts of industrial medicine, can be translated by our placement agencies into successful job placements. Along with this must come the education of the lay public to a true understanding and acceptance of the cardiac, so that his readjustment in industry can be a readjustment among sympathetic and friendly workers.

The Person with Heart Disease Who Wants a Job

JANET PINNER
Employment Consultant for Selective Placement, New York State Employment Service

THE person with heart disease who wants a job is not too different from any person seeking employment. He has as his goal the "ideal" job, a job which will not only give him satisfaction but which will pay him a living wage. In his efforts to obtain employment, the cardiac job seeker will, of course, stress his assets and play down to a large extent anything which he feels might militate against his obtaining employment.

It is a rare individual who never lies or conceals information in order to obtain employment. So it is with persons with heart disease when they come to a public employment office; they are literally trying to put their "best foot" forward. Many are willing to discuss work background, interests and desires pertinent to the job they are seeking. But when it comes to discussing physical capacity, we run into a variety of attitudes.

We have the applicant who states he has a heart condition and frankly tells the interviewer what

his limitations are. This applicant, by laying his cards on the table, enables us to identify him as one who requires the services of a Selective Placement Interviewer. The latter will then require a medical report based upon a recent medical examination. After evaluating the applicant's background and medical history, the Selective Placement Interviewer can discuss suitable job openings—suitable both as to skills and health. This is the kind of applicant we welcome, and with whom we are equipped to work. But all applicants with heart disease do not fall into this category.

We have, for example, the applicant who comes to us while under a doctor's care, knows that he has a heart condition, but has made up his mind that it is his own business and no one else's. He is the person who comes to the public employment office and just conveniently forgets to mention that he has a heart condition. We have no way of forcing people to give us information they wish to withhold. Therefore, such an applicant is treated as any run-of-the-mill applicant would be, and given no selective placement. Many of these applicants are being placed every day by our offices in jobs which are too strenuous for them. But one can't help people if they have no desire to be helped.

Another group of applicants tell us they have heart trouble, know what the doctor has recommended, yet do not wish to be guided by his recommendations. They fall into two categories—those who are over-cautious, and those who are not cautious enough. The over-cautious ones will impose limitations more severe than those of the doctor. Their mental attitude is such that they really feel they can't work, or that they momentarily are going to die; so every job offered to such an applicant is turned down for one reason or another. The other type is equally hard to work with. He knows what his doctor has recommended but, because of financial or other reasons, has decided that he knows what he can do better than the doctor. He is only interested in a job which will give him the greatest financial return, without thought of how it will affect his health. Some of these people fall into cardiac classification IIID and worse, which, we in the employment service think, renders them unemployable in regular industry. Some have work tolerances of less than eight hours. We, of course, will try to place an applicant in accordance with his doctor's recommendations. However, if the applicant thinks that a job is too heavy for him, regardless of what his doctor recommends, we will not refer him.

Then, we have applicants who haven't worked since the inception of their disability and who have been advised by their physicians to change their occupation. This type of person is bewildered, and rightly so. He can no longer return to the type of work with which he is familiar. He is at this point looking for a so-called "easy" job, usually that of a "watchman," little realizing that most watchman jobs require a great deal of walking and climbing. He is in need of some type of retraining—if he is adaptable for training. Please realize that training is not feasible for everyone. Age, interests, adjustment to disability and financial necessity play a large part in deciding whether a person can be trained. If, in our judgment, the applicant can profit from training, he is referred to the appropriate agency. But what about the individual who cannot benefit from training? What to do with an illiterate over 50 years of age who has been an unskilled laborer all his life and can no longer do his work? This is one of the greatest problems we meet, and we do not as yet know the answer!

In the public employment service we are dependent upon members of the medical profession to aid us in doing our job. We must know in specific terms what activities the physician thinks his patients can do without injuring themselves or others. Terminology such as "light" or "sedentary work" is meaningless to an employment interviewer. We need to know what physical activity the patient can undertake and what working conditions he is to avoid. The Work Classification Unit of Bellevue Hospital spells out these physical activities in terms of how much walking, standing, reaching, carrying, lifting, etc., the patient can do. This helps us in determining the suitability of a job for an applicant with heart disease. This information is usable by us only if the doctor has also told the patient what he can and can't do. For example, we are still encountering medical reports in which the doctor states that the ideal job for a cardiac is a "light farm job." This in spite of the fact that the applicant is a New York City born and bred person and, in addition, a severe cardiac. As is well known, there is no such thing as a light farm job. This kind of occupational advice given by the doctor makes it extremely difficult for the employment interviewer to offer any different vocational suggestions to the applicant. The patient feels that he must be guided not only by his doctor's medical advice, but also by his vocational advice.

Now about the New York State Employment Service Selective Placement staff and program. We are not medical social workers, but trained personnel people who are interested in finding suitable jobs for handicapped people. We place disabled people on jobs because we feel that they are qualified to do the job. We do not place them because we feel "sorry" for them. We place only persons who are able to compete in regular industry. If they can't compete, they should not expect an employer to hire them but should turn to sheltered shops for assistance. We try, in our evaluation of a disabled person to consider him as a "total" individual and not to place too much or all of our emphasis on his disability. The disability is only one factor in the applicant's total make-up.

We try to place a person in accordance with his occupational skills, taking into consideration the limitations imposed by his impairment. With cardiacs, we also place considerable emphasis on finding a job where travel will not be too difficult. We often try to locate a job where the applicant can travel against the crowd. For example, instead of having a Brooklyn resident travel to Manhattan daily, we try to find a job in Brooklyn where traveling during the "rush" hours would be against the crowd. We also take into consideration which subway stations have escalators or elevators.

Every effort is made to place the applicant at his highest skill level. We do feel that placing a man at a lower skill job adds to, rather than solves, his problems. It goes without saying that we believe the handicapped should receive the same pay as the non-handicapped for equal work.

Statistics are dull, but here are a few that might be of interest. The first week in October of each year is National Employ-The-Physically-Handi-

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capped-Week, commonly known as "NEPH" week. During this week, all public employment offices throughout the country make an extra special effort to place the disabled. During this week last October, 2,406 disabled persons applied to the New York State Employment Service in New York City for jobs. Of these 14% had some cardiovascular disability. Of the 427 placements made that week, 20%, or one-fifth, were of applicants with cardiovascular disorders. One out of every four cardiacs who applied at the Employment Service during that week was placed. This, in spite of the fact that almost half of the group applying were 45 years of age and over, and half of the group had been unemployed for 20 weeks or longer.

What Industry Thinks of the Person with Heart Disease

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WHAT does industry think of the person with heart disease? This may seem to be an involved question. However, one does not have to be an authority on industrial labor relationships or even on industrial medicine to answer it. Industry primarily is people—ordinary people. Most of industry is very democratic. Just as in all groups of people, all persons in industry have varying degrees of responsibility toward their particular organization. So in a large industry one finds management people, a number of levels of supervision, down to the individual who has only his own job to worry about, and many times this person seems to be the more fortunate one. Today there is a tendency to create many artificial barriers between people and groups of people, for example management versus labor. There is an inclination to think of management people as big, with very little work to do, wealthy and "hard-boiled," and of labor as little people, people who really do the work, poor and "downtrodden." Actually people of the two groups are all the same. Some are big, some small, some kindly in disposition, some "hard-boiled," some happy, some unhappy, some in each group support generously such programs as that of the Heart Association, some do not. A few in each group have high blood pressure or heart disease themselves; most of them do not.

Again, what does industry think of the person with heart disease? Industry is people. What do people think of other people with heart disease? For the most part, industry is sympathetic and wants to help the cardiac as much as possible. Each industry is willing to do its part. Most of the larger industries do employ a cross section of people. Some are handicapped, some are not handicapped. Industries vary just as much as people vary, perhaps even more so. Some industries are small, some are large, some are young and just starting, some are old and well established; some employ mostly men, others mostly women; in some the management and policies are rigid, in others generous and liberal. The types of work in different industries vary, the length of employment varies, some have only relatively temporary jobs, others employ people in the early twenties or before and keep them until they retire at 65. These are all factors affecting employment practices and the employment of cardiac patients. It is one thing to hire a person for a few weeks or months and another to hire him for a lifetime. Again, it is one thing to hire a person for a desk job and another to hire him for strenuous, heavy work. It must be expected that, just like the individual, industry in order to survive must be realistic; it must be sensible in its employment practice. One cannot expect a steel industry to hire cardiacs any more than a telephone company to hire people with hearing defects. Actually, industry's over-all policy is to procure employees who have a favorable prospect for doing a satisfactory job.

I should like to digress for a moment and talk about the handicapped person and his need for work. Today, rightfully, we are putting a lot of emphasis on employment and rehabilitation. It is not a new concept. We are appreciating again, as have people in generations past, that in order to be content—I think one can even say in order to live—man must be occupied physically and mentally. Again this is not a new concept. Let me read you a quotation from Osler's Aequanimitas in which he discusses what Plato had to say about rehabilitation 2000 years ago: "He goes on to say that Aesculapius did not instruct his descendants in valetudinarian arts because he knew that in well-ordered states individuals with occupations had no time to be ill. If a carpenter falls sick, he asks the doctor for a 'rough and ready cure—an emetic, or a purge, or a cautery, or the knife—these are his remedies.' Should anyone prescribe for him a course of dietetics, and tell him to swathe and swaddle his head, and all that sort of thing, he says 'he sees no good in a life spent in nursing his disease to the neglect of customary employment; and therefore, bidding good-bye to this sort of physician, he resumes his ordinary habits, and either gets well and lives and does his business, or, if his constitution fails, he dies and has no more troubles.'"

This was true then; it is true now. As doctors, as nurses, as social workers, we should accept that no patient is well until he returns to his regular occupation, or when necessary to another for which he is fit both physically and psychologically.

What can we expect of industry as far as the cardiac is concerned? First, what about employing cardiacs? Industry is already employing a great many people with heart disease, and with proper and intelligent guidance by the medical profession, industry will employ them in increasing numbers. What about the rehabilitation of cardiacs? Again, already industry is doing a big job of rehabilitation, but with the assistance of the medical profession it can do very much more.

What are the problems and the obstacles, and in what ways can the medical profession help? Briefly, I should like to present some of the problems in industry by outlining the important types of heart disease we encounter.

1. *Functional Heart Disease.* In industry functional heart disease is important, because the cases occur at all ages and cause absence and "turnover"—two major problems in industry. Functional heart disease may be classified into three kinds:

(a) Neuro-circulatory asthenia. This disease occurs in individuals who are under par physically and emotionally. The symptoms are those of or-

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ganic heart disease, i.e., pain over the heart, palpitation, dizziness, and fatigability. (b) Psychosomatic. These cases develop from psychological disturbance, again resulting in symptoms of heart disease. (c) Anxiety type. I regret to say that this disease frequently occurs as a result of the medical treatment or management that some individuals with borderline or suspected heart disease are given. In these cases the individuals are told that they have a cardiac murmur, an increased blood pressure, or abnormalities of the electrocardiogram, but they are not given the reassurance necessary to prevent the development of an anxiety state. All of these types of functional heart disease represent difficult diagnostic problems. In dealing with them, accuracy of diagnosis is extremely important. In these cases the private physician can help industry greatly through careful diagnosis and intelligent management.

2. *Coronary Artery Disease.* This has become a major problem in all industries. This disease develops at a surprisingly early age—sometimes in the late thirties, but in increasing numbers through the forties and fifties and up to the time of retirement. Because of the age at which it develops and because it is more common in men, it represents a serious economic and social problem. As is well known, patients with coronary disease require careful and tactful management, and the doctor and the employer must cooperate in a sometimes very difficult rehabilitation program.

3. *Hypertension and Hypertensive Cardiovascular Disease.* Again this is a disease that seems to be occurring in increasing numbers and frequently at an early age. It occurs with about the same frequency in women as in men. Often the disease itself seems to cause no symptoms and no disability. However, the anxiety state that frequently accompanies it is more disabling than the disease itself.

4. *Arteriosclerosis and Arteriosclerotic Heart Disease.* Coronary and hypertensive disease often are complications of the over-all condition of arteriosclerosis and arteriosclerotic heart disease. This disease with evidences of cardiac or circulatory failure becomes important in later years of employment.

WHAT can the medical profession do to help industry in the employment and rehabilitation of cardiac patients?

1. The medical profession should help industry procure the medical assistance that it needs in its program of preventive medicine. Industrial medicine can be improved. The industrial physician should not take the place of the private physician but should assist him in giving better care and guidance to the employee-patient. The private physician and the industrial physician are not competitors but are members of the same team. The industrial physician should know his company and should know job requirements. He is in a position to practice preventive medicine, diagnostic medicine, and rehabilitaton medicine, but he should not attempt to take the place of the private physician.

2. The private physician should be sympathetic and kind to his patient but at the same time he must be firm with him, and fair and honest to the other people concerned; and I speak here of the employer. Occasionally the doctor misrepresents his patient, and this almost always results in harm to everyone. Many physicians have a tendency to be over-cautious and over-anxious. They are alarmists about their cardiac patients. This in turn has a great influence on the patient and his ability to do his job. In industry we see the problem, particularly in cases of mild and borderline heart disease, where anxiety and apprehension have an important bearing on the ability of these people to procure jobs and an even more important influence on their ability to hold jobs. They have long and repeated absences, which are difficult for an employer. And we see cases where the compensation law, the sickness disability insurance law, or a sickness insurance policy governs the length of absence rather than the employee's illness and length of disability. I am in favor of these laws and in favor of sickness insurance, but, as is so frequently the case, good things have disadvantages as well as advantages. The point I want to emphasize here is that the poor management of the cardiac patient frequently makes it more difficult for cardiacs to procure and hold jobs.

3. A few doctors continually wage a war against industry. These doctors fill out disability certificates when there is no disability. In compensation cases they attempt to submit unreasonable bills. They file compensation forms in cases where there is no suggestion of a causal relationship between the condition and the job. This again is a situation that needs the constant attention of the medical profession because it militates against the employment of cardiacs and other handicapped people.

IN CONCLUSION: (1) Heart disease is a large and growing medical and economic problem. (2) Physicians should accept the fact that no patient is well until he is returned to his regular employment or to an occupation for which he qualifies and is prepared both physically and psychologically. (3) The medical profession, working with its patients and industry, should aim at the employment and rehabilitation of cardiac patients in increasing numbers.

The Case Report

AFTER all, the only really valid reason for writing a scientific medical article is to present the results of useful investigation or seasoned experience, thus adding to the sum of medical knowledge, or to bring together and correlate existing knowledge in order to make it more easily available. Only occasionally is a single case worth reporting, to remind a journal's readers of the existence of some condition that may cause diagnostic confusion or to add to the knowledge of its treatment; it should be reported with the utmost brevity. A case report should always point a moral, whether or not it may adorn a tale.

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The Revaluation of Man : Principles

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PHILOSOPHY has been defined by some as a painstaking research into the obvious. In a sense this is true. Certainly obviousness at times is one of its principal difficulties. "When things are obvious they may be easily overlooked and often they are suspected." Psychology, which is a branch of philosophy, is in the same predicament, despite the fact that there is no dearth of theorists who manage to cloud thing up a bit at times. Modernly, we have two new fields of psychophilosophic concentration called "Social Psychology" and "Industrial Psychology." These have been brought into existence by the peculiar needs of modern society. Their subject matter however, is as old as history. Their subject matter is man.

May Smith, in her book "Industrial Psychology," defines it as "the study of the conduct of those who exchange the work of their hands and their brains for the means to live.... it strictly limits its scope to the material and social environment to which a worker adapts himself while at work and by which he is therefore modified." Even within those restricted boundaries however we find that psychology cannot get along without and leans heavily upon what are known as the "social sciences." Without these it reduces itself to what is sometimes known as "psychotechnology" which is hardly psychology at all. (There are "psychologists" today who maintain that psychology is whatever the psychologist is interested in. In this concept, medicine quite possibly may develop into carpet-weaving.) Psychotechnology is a sort of "inner-sanctum" psychology to them. It busies itself with the time it takes and the energy it consumes to raise a hammer from a low table compared with the time and energy used in lowering the hammer from a high table. It deals with visual aids and illumination, dexterity tests and manipulations, music-while-you-work and easy-on-the-eyes shades of green for the factory walls. Treating this in a rather cavalier fashion is meant to warn you that I am going to venture into the realm of this misnomered unknown field, but we grant its importance and admit it should not be neglected.

The other kind of industrial psychology, gradually winning its divorce from technimechanics, interests itself in human approach, concentrating on man and considering his nature. It seeks out and corrects specific practices or procedures that are apt to cause conflict. It cases the sore spots in labor relations and wards off more serious forms of industrial trouble by meeting them at their inception. The need for this is obvious and it serves a tremendously worth-while purpose. Day to day grievances that bubble to the surface in employer-employee relationships most frequently are the result of everyday frictions that can and should be remedied by ordinary thoughtfulness and common sense. The proper procedure should be adopted to prevent their recurrence. Yet even here it would be asking too much of psychology to become a sort of magic. It postulates common sense. It can't make something out of nothing. Too often the novice looks to psychology for pat formulae with which to resolve unpleasant situations or memorizes 10 rules of foremanship behavior in an effort to win or regain popularity. These and other forms of industrial panaceas are about as useful as the "Handy Family Medical Book" is in the practice of medicine, or the maxim "An apple a day will keep the doctor away" is as a rule of thumb for a medical student. Again we admit that these things have their uses. All this and nothing more, however, is but postponing the day of inevitable showdown.

To repeat: all of the above have their uses. Even so they are "necessary patchwork," as General Hugh Johnson stated in "Or Forfeit Freedom." "It patches up things that go wrong, but only on rule of thumb does it keep them from going wrong again. It is a necessary thing and will be so for years, but it should be supported by a second approach.... and for this we must dig to fundamentals in the form of new and realistic understandings and policies. These may take form too slowly to prevent a strike vote next Monday, but they will improve relationships next year and will keep on improving them through generations to come."

An adequate psychological study of men at work cannot possibly confine itself to the walls of the workshop. A workman does not become another man when he enters the plant. He does not shed the pressure of his individual social life merely because in one place he is more conveniently filed under a number than under his name. We are learning—though many times the hard way—that the whole man comes to work, man with his disappointments, misgivings, antipathies, ambitions, sorrows, worries. All of these were hired by the unsuspecting employer along with the muscles of the man's arms and the brains of his head. This is only one of the very obvious things so long overlooked, so little suspected. Men at work, men at play, men sick and men well—these are the same men, the variables are not mutually exclusive and all contained in the same constant. As Mayo and Roethlisberger never tire of pointing out, it is in *man* that we should look for the key to our problems. "Labor problems may in their inception be social problems and the apparent cause of labor disturbances may have no relation to the real cause. Dissatisfaction which may appear unreasonable on the basis of data available to management, may be most reasonable on the basis of the rumors that reach the workers .... and most strikes have not really to do with economic condition at all but are rather the fruit of a slowly generated, constantly aggravated resentment of personalities."

DURING the past three decades an exhaustive amount of research work was undertaken in an effort to improve production quotas, working con-

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ditions and human relations in industry. One of the earliest of these was the series of tests conducted by Professor Elton Mayo and his colleagues at the Hawthorne Plant of the Western Electric Company in Chicago. Mayo's investigations were to "determine beyond dispute what kind of working conditions lead to the greatest worker output." He conducted them in carefully controlled groups. With some he improved lighting and production increased. He diminished the lighting and production increased. He gave rest periods and took away rest periods, made noise and quieted noise—and production increased. With another group the same tests resulted in diminished production. All in all, as the experts say, the tests were "inconclusive and even contradictory." Yet he did come away with an enlightened sense of the intricacies of the workings of human nature and the knowledge that no tests were subtle enough to measure the subtleties of man. In man and in his nature lie deep the roots of our industrial problems.

At the cost of broadening the discussion, I would like to pound the obvious a bit and talk about the nature of man. I feel on somewhat safer ground here anyway. Man is found practically all over the world. A newcomer in India is so frequently balked into silence by the objection "—but this is India!" that I take refuge for a moment in a universal.

The poet, Gertrude Stein, somewhere in her works has that unforgettable line which I quote from memory—"A man is a man is a man is a man." She was so right! Confirmation of Miss Stein's inspirational observation comes from no less a source than a very recent report of the United Nations Educational, Scientific and Cultural Organization, stating: "Recent scientific investigations fully support the dictum of Confucius (551 B.C.): Men's natures are alike, it is their habits that carry them far apart." Modern labor maxims communicate the same knowledge and may profitably be quoted here. "Labor is not a commodity" is one, though it has not the virtue of Miss Stein's simplicity. "Labor's relations are human relations" is another. They imply that man is fairly well mixed up in industrial problems. And man is the same everywhere. We might say "No matter where you go, nor what you do." What Miss Stein had to say is undoubtedly true—'A man is a man is a man is a man!'

Psychologists and sociologists as well as Confucius have long interested themselves in the discovery of what it was that made one man different from another. In their interest they sometimes missed the obvious that men were much more alike than they were different. All were creatures of God—made out of the same stuff, given a life to live and a destiny to attain, none more or less a man. For the differences, strictly scientific mechanists, determinists, behaviorists, scientifically confined their investigations to things that could be shoved under a microscope, measured with a thermostat, or pricked with a needle, and came up with two major causes of differences—heredity and environment. Yet there is another major cause of difference and that, too, is God. God makes a *man* "so," and heredity and environment (and man himself), are responsible for making him more or less "so."

Children brought up in the sloppiness and carelessness of the slum and bustee environment, though they be native geniuses in God's plan, are bound to mirror their environment in their attitude and approach to life. There is the daily struggle for physical survival that saps vital energies and results in inferior work and concealed resistance to improvement. Ambition is drained off, ideals are ridiculously out of reach, and the daily battle to feed five or six hungry mouths and clothe naked bodies destroys a man's faith in himself and snuffs out all hope of gaining greater skill or seeking a higher goal. A man burdened like that works under the incentive of fear alone, a dangerous incentive.

Professor Eisenberg, of the University of New York, some years ago made a synthesis of surveys conducted all over the world reporting the facts found of the effects of low economic status or unemployment of the parent on children. "The crushing psychological impact of unemployment of low economic status is felt more deeply by children and youth," he stated, "because the disaster occurs in the most impressionable years in their life. Deterioration of school work, emotional conflict and reaction against authority because of 'diminution of the support of authority (which had resided in the parent before unemployment)' are visible. There is a loss of ambition, a feeling of superfluousness in society and an increase of criminality. All the surveyists agreed on the following points of the course of unemployment. First, there was fear, rage or shame followed by a hopeful, active hunt for work; then pessimism and anxiety; and, finally, fatalism and adaptation with a broken attitude. Relief is no solution for it does not satisfy the ego." (Cited by Hepner.)

It is hard for those in supervisory capacities or managerial positions to appreciate that condition of man, or to understand the influences that are incessantly working at the vitals of the under-privileged worker. Most of them are products of a different environment; their sense of ambition, self-improvement, high targets and ideals were not smothered and ground out.

I do not want to over-emphasize the effects of any one cause of these differences in man. I give the former merely as an illustration. Identical twins differ in some ways, also products of the same environment, the same heredity. God sees to it that we all differ in some way and for a purpose. But the slums and the bustees were made by man and not for God's purpose.

As some psycho-theorists have gone wrong in over-emphasizing one or other of the physical determinants of man's personality, so social theorists have gone wrong in over-emphasizing one or other of the tendencies in man's nature. The factor inclining to error possibly lies in the personality of the theorist. Looking at man we see he is at once an individual and a social being. Just as the normal man is considered to be neither an imbecile nor a genius, neither an extrovert nor an introvert—so man's nature is neither social, nor anti-social, neither an individualist nor a collectivist. The social doctrine of Liberalism is an extreme. It exalts the individual at the expense of society. Man in this doctrine is perfect and complete in himself and the criterion of his activities and morals is merely individual advantage. Collectivism is the other extreme. This social error looks upon society as the only criterion and the importance of the individual is merely that which the group deigns to offer him. Man lies between these two extremes

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and his true position in society is most clearly illustrated in the classical example of the living organism—the body. This social theory has come to be known as the "organic concept of society."

Just as in an organism—the whole is more important than any of its parts, so in society the community is prior in interest to its members. Each individual person, just as each individual cell or sense or faculty of the human body, works for the benefit of the entire organism, the community. Each member works for itself at the same time that it is working for the good of the entire organism. There is a living together and a working together and for one another that is imposed by the very nature of man, impelling him not merely to his own perfection but to the service and perfection of the community. Thus we are "interdependent beings within a social framework that commands unity and cooperation," and consequently both the individual and the community must be defended against excessive encroachment from the other. This is an ontological principle which of course must have its influence in the psychological make-up of man.

I am not at all going astray or too far afield when I insist on these very fundamental principles of nature. Two hundred years ago, more or less, in the industrial world, rugged individualism and *laissez-faire* capitalism exalted the Adam Smith doctrine that the pursuit of private self-interest would, *ipso facto*, lead to the common good. The proof is in the pudding. Today man is trying to regain his balance. We are in the midst of social change and our thinking contributes its weight if only most minutely. The axis of the social movements of history tends to fluctuate between the two extremes of individualism and collectivism, and now we are beginning to swing back from that era of unrestraint. Man again seeks balance.

The unrest which is noted in the industrial society of the present day does have its roots in that past. The basic trouble lies in the fundamentally false philosophy of those days which economic necessity and expediency appeared to demand that each succeeding generation must follow. That is why it seems best to point out that, while modern industrial psychology and psycho-technology have their uses, to expect them to dissolve the more deep-rooted disorders of the present day is ludicrous. We are not casting blame. The disorders we are speaking about were not deliberately stirred up, (the liberals, being part of the organic whole, also suffered from their appearance) but they followed as surely as the night does the day. As Professor Kirkaldy, in his recent Perin Memorial Lectures here, commented: "While more honor is due than is commonly ascribed to the industrial pioneer, we do well to remember that his very success brought in its trail the problems of human relations which we are still so far from having solved."

PREVIOUS to the industrial revolution man was not without his troubles. They were psychologically different at least. Man knew what they were. Ordinarily he could reach out and put his finger upon the source; and knowledge, while not always consoling, is satisfying and appeases the intellectual appetite. There was not then present the wide-spread mental unrest, the sense of forboding, suspicious criticism, insecurity and apathy. There were even periods in history of a kind of mass enslavement of man, but they were seemingly periods of mass unconsciousness from which society was always aroused. In fact all of the characteristic problems of labor and capital existed before the revolution though they were multiplied during that period. The industrial revolution was not an abrupt change but a rapid one. The factory system predated it, but the system was confined to certain trades which of their nature demanded compact methods of production. Yet the mode of production, even then, generally left some scope for pride of workmanship, esthetic satisfaction and expansion of personality, while contributing to the sense of solidarity with society. For the common workman there was not that clear cut unbridgeable gap between himself and his employer, his work and his contribution to his fellow man, and its value to the community; and the trade organization of the guild system presented him with self assurance. The apprentice had a purpose in life and a goal to be won. He moved up the scale as his experience and skill in achievement prospered. He became the owner of his own tools and looked forward to being his own master with all of the prestige that such a position afforded him.

The psychological value of such a system cannot be ignored. The skilled workman was a power to be reckoned with in his community. He was conscious of the fact that the smooth-running of the life of the community depended upon his contribution. The miller who ground the wheat was of prime importance to the farmer and to the baker and the family of those days. The iron worker, the cobbler, the smith was frequently assured, and truthfully so, that he was the indispensable man. The fitter enjoyed a pride of life in his calling that is not at all proffered to the fitter in a factory of today. Then the workman was not merely socially accepted but definitely needed. He could judge the value of his services to the community and did not have to be subjected periodically to "pep" talks, or "educated" in regard to his dint of contribution for the general welfare. And the personal relationships he established added to his means of estimating the proportion of service he contributed in relation to the whole. That note of *service* in the organic structure of society is important. It had little or no place in the philosophy of the advocates of rugged individualism. It continues to persist in many of the professions, but in "big business" too frequently it remains merely as a coccygeal vestige.

A modern example of this incising of man from his human dignity and station in life can be illustrated by examples afforded to us in the cases of the rural factory workers. There is no scientific accuracy attached to these statements, but it does seem that we can exemplify our statements with these men. The workers who drift into a factory to seek work from a rural area, are, I am told, not too conspicuous in their achievements nor of considerable value to production quotas. Many of the unskilled workmen are from this group. They cannot be classified as having been over-influenced by the psychological ravages of slum environment and poverty in city life which we mentioned previously. Their span of time in the city is said to be spent in a "one foot in the factory—one foot on the farm" sort of way. They quickly lose interest in their work, respond to few incentives, take little pride in accomplishments and are rather frequent ab-

sentees. Almost invariably, I am told, when they have accumulated a little money they are up and off to the soil—there to remain until they must replenish their treasures by the fruit of more troublesome though not more difficult, toil. Is it any wonder? What is the status of such a workman in the factory? What is his importance? Where is the human satisfaction in his work? The lohar, the chamar—whatever the status or the calling of a man in the village might be, in his village he has some standing. His services are of value. That is a conscious fact. He is a valued member of a society which has a really highly developed sense of community and meets the need, the craving that springs from nature of a man, for personal achievement and social participation.

This demand for recognition is more graphically portrayed in this paragraph quoted from Leo C. Brown's essay "Towards Industrial Peace." "The fact that man is a social being implies more than the fact that he has a capacity for social activity. It means that a man needs society. It means that he has been fashioned for cooperation with others and normally perfects himself by such cooperation. Compared with the workman in simpler societies, our modern industrial workman is rootless. Today his trade does not give him a direct title to status in the industrial community. As a result many workmen feel no sense of continuous association or community of interest with the economic activity that provides their income. This rootlessness is not merely a sense of insecurity, it also reflects an inadequate sense of contribution to the community. And the circumstances of his employment bring home to the workman that he is as replaceable as any of the parts he uses and is much less indispensable than the machine he runs. The human satisfactions of a recognizable and meaningful participation in social activity are weak, if not entirely lacking."

Wherever the machine has the power to dominate over men, this humiliating situation cannot be remedied. There were occasions when efforts to overcome this subjection of man to matter were distorted in such a manner as to oppose any amelioration of the conditions. A case in point would be Taylor's plans to bring about a humanizing of working conditions. The "time-motion" ideas of Taylor were seized upon eagerly because they held a promise of higher production levels and lower costs. There was a pell-mell rush to develop them for the production advantages they contained which completely subverted the original intentions of the plan and brought about the further degradation of man. Taylor wanted to cut the cloth to fit the men and "Taylorism" was a perfection of devices that cut the men to fit the cloth. Most, if not all of the painful and undesirable elements of Taylorism have been modified today, but many union leaders still smart under the memories of the recent past.

In like manner industrial psychology for sometime implied a study which had very little to do with the proper adjustments that had to be made with regard to the human dignity of men at work. It found more profitable scope for its pursuits by subordinating man to manufacturing. It is gratifying to see a shift of emphasis of late and concentration of interest on the more complex problems of human origin in industrial relations.

When I attempted to confine this to the basis of human relations in industry we were confining ourselves to the radical business of "digging about the fundamentals" upon which any acceptable or stable form of society must be built. There are tremendous problems yet to be solved. There are other problems of course, not quite so vital, but which demand a more immediate solution. These are the problems arising from day to day with no great import or significance beyond that of any other problems of human relationships. These are the proper study of industrial psychology to determine more fully their ultimate causes, and much work has been done in that direction. There is universal agreement today among labor relations experts that the most persistent and dominant grievances have their causes in the lack of intelligent conduct of human relations resulting in a slight to human dignity. It is difficult to get management or employers to understand that frequently there is no economic basis for persistent grievances. Trouble is sickness showing itself. Even though pain may be localized in one spot the actual cause of the pain may be found in a different locality, the apparent cause having little or no relation to the real cause. This does not mean that adequate compensation for the work of a human being is not of primary importance. We do not mean that a just wage is a secondary consideration. But that compensation, once granted, does not remove all sources of trouble—even though these troubles may be quelled temporarily by frequent increases in income. This is the most common method of trying to meet the problem since the tendency is to envision man still chiefly responsive to economic stimuli. In "Understanding Labor," James Fitzpatrick develops the thought this way: "The labor problem is not strictly an economic problem though it is a problem rooted in economic necessity and sometimes requires the use of an economist's tools. Basically it is a problem which is human, a problem of adjusting men to men, men to themselves, and men to matter. It arises out of and is conditioned by the necessity of subordinating the free will of one man to the free will of another."

Perhaps the following will illustrate this more clearly. Here are the problems listed most frequently by research men in the analysis of labor difficulties once a decent wage is obtained. These are not the "pains" complained of, necessarily, but their diagnoses: unfair and dishonest superiors, giving orders without reasons, giving orders outside the scope of legitimate authority, judging on personalities and not merit, ignoring or "burying" complaints, giving inadequate instructions, appropriating credit for a worker's idea, flaunting superiority, odious methods of paying wages, lack of communication. These are very human resentments that burn at a slow heat until some more tangible snag in relationships gives them an opportunity to vent themselves.

In India the problem of an industrial society is just beginning. The problem of union-management relationships is just beginning. It is most desirable that not merely the mechanical progress made by countries longer industrialized will be adopted here but also that the limited social progress in human industrial relations made by the men who manage and the men who labor will also be adopted. The actual practice of these relationships we hope to discuss further at another time.

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INDUSTRIAL MEDICAL ASSOCIATION

The President's Page

THE Association's Annual Convention, to be held this year at Cincinnati from April 21 through 24, promises to be occupational medicine's greatest meeting to date. The city provides in abundant measure the fundamental requirements of a good setting for our convention: it is an important center of commerce and industry, and is pre-eminent as a location of medical education and research. It is, moreover, the location of world-famous Kettering Laboratory of Applied Physiology and of the Environmental Health Center of the U.S. Public Health Service. Other attractions are a reasonable hope for traditionally gentle spring weather during the third week of April, and a convention hotel which is one of the country's most beautiful. The event will mark the tenth anniversary of the Association's previous convention in Cincinnati. Those who were there 10 years ago will recall the growing awareness of the essentiality of industrial medicine to a successful prosecution of the war, and the emergence of a concept, however slow to crystalize, that ours was a special field of practice attuned to, and designed to deal with, a large and important share of the human problems of our day. Those who are present this time will witness the measure of reality to which the concept has been brought in a decade.

As has been the custom in recent years, our own convention will be held in conjunction with the conventions of four other associations: American Association of Industrial Dentists, American Association of Industrial Nurses, American Conference of Governmental Industrial Hygienists, and American Industrial Hygiene Association. The five conventions make up the Industrial Health Conference. The cooperative planning and broad policy discussions related to this complex enterprise began a year in advance of the Conference. The detailed plans necessary for a smooth-running meeting will undergo constant refinement until the last speaker ascends the rostrum. The final result will be the product of the administrative skills of more than 100 persons to most of whom it is impossible to give adequate recognition at this point. Those who are contributing prominently to the success of the over-all conference and more specifically to our Association's Convention are shown on adjoining pages.

The location of the Industrial Health Conference at Cincinnati makes feasible a return to its traditional pattern of hospital clinics, field trips, and scientific sessions. Both medical and surgical clinics will be presented concurrently at the Cincinnati General Hospital on Monday and Tuesday forenoons of the Conference week. The field trips, scheduled for Monday afternoon only, will include visits to the laboratories of the U.S. Public Health Service, to Kettering Laboratory, and to selected industrial plants. Those with a real interest in the tours should make it a point to register early on Monday. Our Association will hold five technical sessions, beginning on Tuesday afternoon and continuing through Thursday afternoon. These will cover the essential areas of industrial health: clinical medicine and surgery, administration, industrial toxicology, and industrial hygiene. A sixth and final session, on Thursday afternoon, will be devoted to a full discussion of the program of evaluating medical services in industry taken over some time ago by the American Foundation of Occupational Health from the American College of Surgeons. These topics are to be covered in 32 papers already scheduled with a possibility that a few more may be added. The practitioner of occupational medicine will find here a most useful post-graduate week.

The Association's annual business meeting and banquet are moved forward from their traditional Thursday position in the convention week to Wednesday afternoon and evening. Of particular interest with regard to the business meeting will be the employment for the first time of the method of election of officers defined in the Association's new by-laws adopted last year in Atlantic City. A nominating committee is charged with the responsibility of developing a slate of candidates for the six places which will become open on the Association's board of directors. The slate must be published in advance of the meeting, and the voting is to be accomplished by written ballots cast by the Association members present at the business meeting. As is customary, the annual banquet is to be marked by nothing more serious than the bestowing of awards to members and organizations who have distinguished themselves in our field of work; for the most part, its program will strike the lighter notes of the convention week.

Many of us who regularly attend the Industrial Health Conference find unscheduled and informal visits with confrères whom we see only on this yearly occasion to be the most profitable experiences of the week. The continuation of an argument carried on in yearly installments, the verbal exchange of information which cannot be published, or the warm hand clasp of colleagues who are growing older and wiser together hold for many of us the real meaning of this Association.

A. J. Kammer

INDUSTRIAL MEDICAL ASSOCIATION

Earle A. Irvin
General Chairman, Conference
President-Elect, I.M.A.

1952 Conference Officials

HERE are the Association Officers and Chairmen of the many General and Special Committees whose combined efforts are being directed toward making the forthcoming Industrial Health Conference at Cincinnati, Ohio, April 19-26, 1952, as Dr. Kammer suggests on his President's Page, "occupational medicine's greatest meeting to date."

Edward C. Holmblad
Managing Director
Conference

Stephen G. Halos
Director of Exhibits
Conference

Lester M. Petrie
President
A.C.G.H.

Anna M. Baetjer
President
A.I.H.A.

Thelma Durham
President
A.A.I.N.

James H. Sterner
Convention Chairman
I.M.A.

H. H. Dougherty
President
A.A.I.D.

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INDUSTRIAL MEDICAL ASSOCIATION

Harry E. Tebrock
Committee Chairman
Publicity

F. F. Heyroth
Committee Chairman
Arrangements

P. J. Valaer
Committee Chairman
Scientific Exhibits

William R. Bradley
Program Chairman
A.I.H.A.

Robert A. Kehoe
Scientific Meetings, I.M.A.
Conference, A.I.H.A.

Edna M. O'Connell
Local Chairman
A.A.I.N.

John C. Soet
Program Chairman
A.C.G.H.

F. J. Walters
General and Program Chairman
A.A.I.D.

H. W. Lawrence
Banquet Chairman
I.M.A. and A.I.H.A.

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INDUSTRIAL MEDICAL ASSOCIATION

Frank Princi
Coordinator, Clinical Sessions
I.M.A.

E. C. Binstadt
Chairman, Plant Tours
I.M.A.

Paul J. Bamberger
Coordinator, Special Sections
I.M.A.

Lewis J. Cralley
Conference Co-Chairman
A.I.H.A.

Conference Organizations

I.M.A.—Industrial Medical Association.
A.I.H.A.—American Industrial Hygiene Association.
A.C.G.H.—American Conference of Governmental Hygienists.
A.A.I.N.—American Association of Industrial Nurses.
A.A.I.D.—American Association of Industrial Dentists.
Headquarters, Netherland Plaza Hotel, Cincinnati, April 19-26. 1952.

Mary L. Bath
Arrangements and Entertainment
A.A.I.N.

ASSOCIATION NEWS

E. A. TERRY, JR., Medical Director, since 1948, for the General Electric Company plant at Bridgeport, Connecticut, has been transferred to the G.E. plant at Louisville, Kentucky.

S. T. NICHOLSON, JR., is now Medical Director at the Pottstown, Pennsylvania, plant of the Doehler-Jarvis Corporation. MARTIN G. VORHAUS, M.D., is General Medical Director for the Corporation, with headquarters at Toledo, Ohio.

THE Annual Meeting of the TERRITORIAL ASSOCIATION OF PLANTATION PHYSICIANS was held on November 14, 1951, at my plantation, Waialua Agricultural Company. The Pan Pacific Congress being in session at the same time in Honolulu, made it impossible for us to have more than a one-day meeting. We had an afternoon Scientific Session with two very good speakers—DR. J. A. BARGEN, of the Mayo Clinic, who spoke on Diverticulitis, and DR. EVERETT I. EVANS, of Richmond, Virginia, who spoke on Management of Burns in the Small Hospital. These papers were well received. In the evening cocktails were served at the manager's home, with dinner later at our home.

—FRANK H. HATLELID, M.D.,
Immediate Past-President,
T.A.P.H.

Cincinnati Conference Program

THE Preliminary Program for the Industrial Health Conference at Cincinnati, April 19-26, 1952, has been mailed to all readers of this Journal. The completed program is expected to be ready for publication in these pages prior to the Conference.

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Central States Society's Milwaukee Meeting

CENTRAL STATES SOCIETY OF INDUSTRIAL MEDICINE AND SURGERY, jointly with the Wisconsin State and Milwaukee County Medical Societies, is sponsoring a one-day program at Milwaukee, Wisconsin, Thursday, March 13, 1952. A Symposium on "Salvaging the Injured Hand," with DR. WILLIAM FRACKELTON as Moderator, is set for the morning opening. This will be followed by a tour of the Miller Brewing Company plant, with special attention to the eye-injury and safety-goggle program, hand laceration hazards, employment of the diabetic, medical records, placement examinations, and atomic defense and bomb shelter plans and equipment. After luncheon, and a film on "Your Ear and Noise," DR. MEYER FOX, of Milwaukee will discuss "Medical Aspects of the Industrial Noise Problem," and DR. LEONARD J. GOLDWATER, of New York, will speak on "The Employability of the Older Worker." In the evening DR. EDWARD M. DORR, of Northwestern University, will have as his subject, "Backache Due to Gynecological Pathology," and following this there will be a Symposium on "Problems of Women in Industry," with PROFESSOR ROLAND CRON, of Marquette University, as Moderator, and DR. EDWARD J. SCHOWALTER, Medical Director, Western Electric Company, DR. EDWARD M. DORR, and DR. H. CLOSE HESSELTINE, of Chicago, as panel members.

The Railway Surgeons

THE Program for the Sixty-Fourth Annual Meeting of the AMERICAN ASSOCIATION OF RAILWAY SURGEONS, at the Drake Hotel, Chicago, Tuesday, Wednesday and Thursday, April 1-3, 1952, is about to be mailed to all readers of this Journal. The three-day schedule includes 19 major presentations on medical and surgical subjects, with the Annual Banquet on Wednesday evening. WALTER H. JUDD, M.D., Congress of the United States, 5th District, Minnesota, will be the Speaker; his subject, "Which Way America?" The complete program will appear in the March issue.

BOOKS

"What Can He Do?"

PHYSICAL CAPACITIES AND JOB PLACEMENT (A Critical Study of the Theory and Practice of Job Placement in Nine European Countries and the United States, with Special Reference to the Placement of Disabled Persons, and Containing a Manual of Operations). By BERT HANMAN, Grand Pensionat, Strandvägen 7A, Stockholm, Sweden. Published by Nordisk Rotogravyr, Luntmakaregatan 25, Stockholm; 164 pages, with Index and Forms.

HERE in compact form is a comprehensive coverage of the subject of employing handicapped workers. The author has had the opportunity of giving this subject eight years of intensive study in the United States and in Europe. He presents a critical review of a number of existing methods of job analysis, physical capacity appraisal, and systems for matching disabled workers to jobs. One of the principal values of this volume lies in this review, for here will be found the shortcomings of the various methods that have been promulgated and tried with varying degrees of success. For those individuals interested in the basic concept of proper job placement, and for industrial organizations interested in setting up a program for utilization of handicapped workers, these critical analyses will be helpful, particularly in the avoidance of earlier mistakes and inadequate and cumbersome methods.

The author presents a system of worker appraisal and job appraisal which he has developed with the cooperation of several industries in Sweden. He defines his new system as a specific method in contrast with other methods which he labels as rating methods and disability methods. It is interesting to note that he has abandoned the method he used in the Richmond Shipyards during the war; this was similar to the plan recommended by the War Manpower Commission, which requires a detailed written description of physical demands, work conditions, and hazards in addition to a check list of job factors. We believe that the elimination of the detailed written description, as also recommended by some other researchers in this field, is an important step in the right direction. Certainly, industrial use of large numbers of the physically handicapped will be in direct ratio to the simplicity of the operations involved in matching them to jobs which they can fill satisfactorily. Simplicity of system is essential; otherwise, employers will continue to prefer the so-called normal worker because of his greater adaptability and less difficulty in placement. The key to utilization of the handicapped lies in a specialized language for expressing the requirements of jobs and the various abilities of workers. The difficulty has been in determining the various elements important to this subject, and in developing proper methods of evaluating each element. For example, the phrase "light lifting" means what? How much? How often? These and many other terms are subject to a variety of interpretations by each individual. Some constructive contributions to this subject are made by MR. HANMAN. He also develops the theme that there are only a few non-handicapped workers and, therefore, practically all workers should have proper job placement. He suggests a detailed step-by-step program for the hiring, adjusting, training, etc., of workers which should be of great help to many firms needing better organization of their employment program.

A method is offered for rating employees according to their positive abilities rather than on the basis of their disabilities. Desirable as this may be from the standpoint of avoiding the use of terms such as disabled or handicapped, having the stigma of "cripple," it is doubtful whether it is possible to get acceptance of this plan. By the positive method the worker is evaluated on the physical activities he can perform without mention of his limitations. By process of elimination, however, one would arrive at the fact that he had certain negative physical capacities in which he would be limited, etc. It is a longer way to arrive at the same conclusion. Is it not simpler to say that this worker has epilepsy, that one has diabetes, the next one has an artificial leg, etc., because with either route the same conclusion is reached, namely, that there are certain limitations, and these limitations must be considered when placing the worker, if proficiency and safety are to be considered, as they always must be.

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Words have meaning according to our comprehension of them. Words describing diseases and disabilities have generally accepted significance. It is our fault if we have erroneously attached greater significance to certain words than they should have. Rather than change our common language for expressing disabilities—which can be definitely negative in their limitations on our full scope of physical activities—why not continue to emphasize that the disabled have much more ability than disability.

Education to correct common misconceptions seems to be the answer. HANMAN'S book will be most helpful in this direction, too.

—CLARK D. BRIDGES.

[NOTE: This book may be procured by sending $4.60 ($4.25 plus $.35 for postage and insurance) to Nordisk Rotogravyr, Luntmakaregatan 25, Stockholm, Sweden.—ED.]

Sickness Benefit Plans

THE OPERATION OF SICKNESS BENEFIT PLANS IN COLLECTIVE BARGAINING: By Fred Slavick, Research Assistant, Industrial Relations Section. Industrial Relations Section, Department of Economics and Social Institutions, Princeton University, Princeton, New Jersey; 1951; paper bound; $2.50; pp. 109.

THE foreword to this brochure makes use of this language: "The American people are in the painful process of evolving some system or complex of systems which will assure protection of each individual against the want of medical services or of income in periods of ill health. At the same time, and often in the same community, there are now in operation the diverse systems of individual purchase of medical care on a fee-for-service basis, group purchase at averaged cost, individual indemnity insurance, company group insurance, mutual benefit associations, state social insurance, and public medical care. Perhaps the results of such varied experimentation will justify the continuance of this wide array of systems for assuring health protection. It is important, however, that the lessons learned in the development of each method be recorded and analyzed." Then follows, in rich detail, consideration of many analyses. In due course, the reader reaches the section devoted to summary and conclusions. Here the following language appears: "Experience of the plans studied in this report indicates that sound, workable programs to provide some degree of protection to employees against the hardships resulting from illness and accident can be operated successfully through collective bargaining. Many of the difficulties, such as unsound financing, malingering, and haphazard claim administration which plagued earlier union programs and were foreseen as possible stumbling blocks to the current type of plan, failed to materialize."

Compensation

WORKMEN'S COMPENSATION PROBLEMS: Proceedings of the Thirty-Sixth Annual Convention of the International Association of Industrial Accident Boards and Commissions, Milwaukee, 1950. Bulletin No. 142; paper bound; pp. 248. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C., price 50 cents.

THIS annual report of proceedings well discloses that the troubles of compensation boards now chiefly center about occupational diseases. No longer are there long discussions over amputations, hernias, and kindred difficulties. All of that, reasonably well has been standardized. Instead, and in gratifying fashion to the medical man, the members of these boards are facing the solution of nontraumatic affairs, such as hearing and noise in industry, tuberculosis as a genuine occupational disease among medical and hospital workers, the influence of trauma on the course of tuberculosis, the influence of hot environments, the rehabilitation of victims of occupational diseases and trauma, and engineering appraisal of occupational disease exposures. Cheering to the physician is one paper on how to avoid litigation in industrial compensation adjudications. By no means is the entire report devoted to occupational diseases. Dear to the hearts of all accident board commissions are such items as "Present Conditions of Workmen's Compensation Laws and Possible Changes," "Basic Principles of Workmen's Compensation," etc. Even though the price of this small book were not so little as 50 cents, many industrial physicians would do well to procure it. The symposium on tuberculosis, as it relates to industry, alone is sufficient to promote reading.

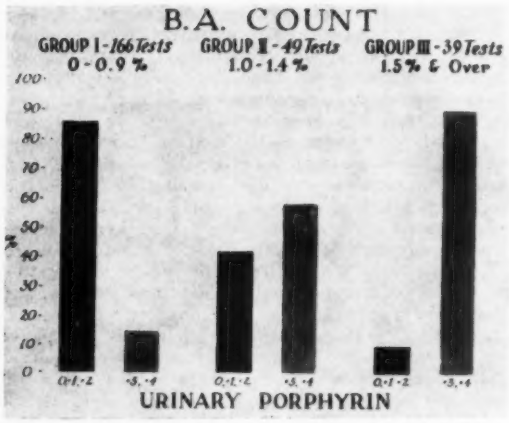
SCIENCE MINIATURES

Correlation Between Porphyrinuria and the Basophilic Aggregation Test

EDWARD E. DART, M.D.
San Lorenzo, California

AS FAR back as 1893, Garrod[1] reported a pathologic increase in urinary porphyrins in cases of human lead poisoning, and physicians from Europe have stated that the determination of coproporphyrin in urine has been a popular test for detecting lead poisoning on that continent for many years. The report of de Langen and ten Berg[2] of a simple test for the determination of coproporphyrin in urine has been a catalyst for the initiation of investigations of this subject in the United States. Johnson and Whitman[3] described a method for standardizing the de Langen and ten Berg test which is easily performed. Maloof[4] found a close correlation between the excretion of lead in the urine of employees exposed to lead and the increased excretion of urinary porphyrins. My work indicates that there is a close correlation between increased coproporphyrin excretion in the urine and the basophilic aggregation count of McCord.[5]

This work was facilitated by the cooperation of the entire management staff and employees of the Battery Products Company, of Oakland, California. Two hundred and fifty-four simultaneous tests for urinary porphyrin, using the technique described by de Langen and ten Berg and the basophilic aggregation test as described



Showing the effect on the incidence of definite coproporphyrinuria produced by grouping the subjects in accordance with the level of their basophilic aggregate count, e.g., normal, questionably increased, or unquestionably increased.

by McCord were performed on 61 subjects. The results of porphyrin tests were grouped in three divisions according to whether the concomitant basophilic aggregation count was normal (0-0.9%), questionably increased (1.0-1.4%), or definitely increased (1.5% and greater). For practical purposes, it was found desirable to group the urines with porphyrin content ranging from none to plus two together, and likewise to consider those with plus three or more in another single category. In this manner it is possible to say that a man has normal or very little increase in the urinary porphyrin, or, that the porphyrin in the urine is markedly increased. It is noteworthy that 86% of examinations showing a normal basophilic aggregate count also show normal or only slightly increased urinary porphyrin, whereas 90% of those indicating a definitely increased basophilic aggregate percentage have markedly abnormal value for porphyrin. The intermediate group as regards the B.A. count is likewise intermediate with respect to urinary porphyrin. The 14% of high porphyrins in Group I may be due to the fact that porphyrinuria develops earlier than does the increased basophilic aggregate count. The 10% with low porphyrin values in Group III may be due to occasional errors in technique or possibly to a rare false negative test.

In summary, porphyrinuria in subjects having exposure to lead is interesting because porphyrinuria occurs as a metabolic disorder in general medicine. The study of porphyrin metabolism may well lead to a clearer understanding of the pathology of lead poisoning. The determination of urinary coproporphyrin is of value in the medical control of exposure to lead because it is simple to perform—with a little coaching and experience and $15.00 worth of equipment, an industrial nurse can readily do the routine testing, and the results obtained appear to be comparable to those found in other screening tests commonly used in the lead industries. The determination of urinary porphyrins should never replace hemoglobin determinations, basophilic aggregation counts, careful physical examinations, and other commonly employed procedures to ascertain the clinical status of the patient. The determination of urinary porphyrins cannot replace analysis of urine and blood for lead content in establishing the diagnosis of lead absorption or poisoning because it is not pathognomonic of lead absorption.

(15858 Hesperian Blvd.)

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Lead Poisoning from Candles

CAREY P. McCORD

Preterlapsed insight has provided a startling lot of unexpected sources of lead exposure both in and out of industry. Startling was the disclosure (by way of example) that for a period snuff was adulterated with the brown oxide of lead, with a number of indisputable instances of lead poisoning. To be added to this group of singular exposures is the possibility that lead poisoning may be traced to burning candles in households and in churches. No longer are candles cheap. To furnish longer burning life, some manufacturers introduce wicks containing a slender core of lead wire, or at least some low-melting metal wire. The flame temperature is sufficient to melt and partially evaporate the metal. Current observation is that a single candle seldom is in use; batteries of six or a dozen are more often in evidence. Conjecture is that some intake of lead vapors is inevitable. The contention is, that regardless of the findings from any precise investigation, metals other than lead and other toxic ones suitably may be utilized in candles so that this exotic social practice may remain a pleasure and not a potential source of affront to health.

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PRODUCT RESEARCH AND DEVELOPMENT

Articles selected for publication in this section of the Journal are related to commercial or prospectively commercial products and, by requirement, are written by physicians, represent original work not previously published, and have some flavor of newness. These articles are published so that newer products may become the recipients of further consideration and appraisal in the industrial medical field. The claims and conclusions of authors are not necessarily approved or accepted by this Journal.

Advance in the Local Treatment of Ambulatory Industrial Burns

WALTER E. FLEISCHER, M.D.
Medical Director, Rustless Division, Armco Steel Corporation
Baltimore, Maryland

THE ever-increasing accounts of new therapies in medical journals bring to mind the admonitions of the editorial, "Industry and the Proving of New Therapeutic Agents," in the December, 1950, issue of *Industrial Medicine and Surgery*. We believe it was timely to note therein, "No physician is likely to be impressed by a large series of two cases . . . .," and to warn of the detrimental effect of using an unproved product experimentally in the field of industrial medicine. We too, deplore and condemn the ill-advised experimental use of unproved products on any plant population, and we approve and urge the application to industry of products and methods that have proved their merit in other fields of medicine. The composition of modern industry is too complex, repercussions of such experimentation too great, and the scientific intent of such studies too dubious to condone such types of investigation.

The diversified array of burn offerings in the medical literature, ranging from tannic acid through various dyes, picric acid compounds, cod liver oil, anesthetic ointments, chlorophyll derivatives, sterile petrolatum, closed pressure method, bromated organic bismuth, open-air method, sulfa and antibiotic ointments, a nitrofuran, blood derivatives and, more recently, streptodornase and streptokinase, must indeed perplex the industrial physician as to the method of choice for local treatment of burns. Yet, each method, documented with good results and backed by scientific sincerity, has added to our knowledge of treatment.

Before we had the temerity to consider our studies as progress, we paused to consider, "Does this represent a superior method for the treatment of the ambulatory industrial burn?" Results of 581 thermal and chemical burns and 102 abrasions, treated in a steel mill dispensary over a 12-month period, are the basis for our affirmative answer.

In November, 1950, we were impressed with the results of Dr. R. Curtis on 100 burn cases, at Union Memorial Hospital, treated with a preparation of partially hydrolyzed casein and zinc impregnated gauze. We felt that the material used, Zinax® Burn Dressing,* had been proved to have sufficient merit to warrant its industrial application. We believed that if it could be used on the ambulatory, industrial burn, the results would be better than with other methods available. Accordingly, in December, 1950, we arranged for its use as standard procedure on all burn cases.

Composition of Material

INJURED cells have an uncertain future irrespective of whether the damage is produced by thermal, chemical, physical or radioactive forces. The continued existence of such cells is influenced and probably many times determined, by the nutrition received from the surrounding extracellular fluid. Blood protein loss is of primary significance with major burns but of secondary importance with minor burns. Curtis, Brewer and Rose[1,2] believed that this concept of localized cellular nutrition and prevention of loss of blood proteins was basic in burn treatment, if progress were to be made beyond simply keeping the wound clean and the patient comfortable. Their investigations over a period of 10 years with human and bovine serum, plasma and placenta serum, indicated that a non-toxic, non-sensitizing, inexpensive protein simulating human plasma protein or its basic amino acids would fulfill the local nutritional requirements of such damaged cells and would participate in the formation of the desired type of sheltering film. Their thorough study of available proteins revealed that a phospho-protein, casein, could be treated to form a gel which would set as a film, the outer surface of which would dry relatively quickly with the inner surface in contact with cells remaining in a gel state for some time. This gel is prepared by the precipitation of the casein from milk by the addition of dilute acids. To lower the surface tension and thereby facilitate application to the wound, sodium lauryl sulfate, which also acts as a bacteriostatic agent, is added. The film over the burn, formed by the drying gel, is made pliable by the addition of a plasticizer, sodium lactate. Autoclaving of these mixed materials produces sterile, partially

*This material is "Zinax" Gel and "Zinax" Gauze, manufactured by Hynson, Westcott and Dunning, Inc.

hydrolyzed, sodium caseinate with a pH of about 7. This is basically an aqueous gel, composed of essential amino acids, which does not deteriorate on freezing and subsequent thawing. No chemical change has been found after storage for several years in hermetically sealed containers. The consistency of the gel allows it to be easily spread on prepared gauze for application to the burn. This gauze, impregnated with zinc acetate, 30 mg. per square inch, in contact with the gel, forms a semi-permeable membrane retaining the serum proteins but allowing the slow evaporation of water. The gel beneath this membrane and in direct contact with the injured cells forms an abundant local supply of amino acids for continued cell existence. By adhering to both healthy peripheral and damaged central cells, this semi-permeable film, fixed in the mesh of the gauze, exerts sufficient pressure to minimize local edema. We believe that the proteolytic enzymes released by the injured cells are retained at the burn site, resulting in an effective auto-debridement of devitalized cells.

Intra-Plant Treatment of Burns

AFTER appropriate systemic therapy has been instituted on a major, hospitalized burn, the purpose of local treatment is to obtain a clean lesion from which dead tissue has been removed and which can be grafted with skin as early as possible. Throughout all such procedures the hospitalized patient may be immobilized as needed. The ambulatory burn case who is willing and able to continue at his job in the steel mill, regenerates new skin under somewhat different conditions. When the environment of a hospital is contrasted with that existing in heavy industries such as operating steel mills, where radiant heat from molten steel and red-hot bars, dust from lime and iron ore, droplets of acid or alkali splashed from pickling tubs, and perspiration, may annoy and irritate both the patient and his burn, the difficulties of adequately and comfortably dressing such lesions become apparent. The magnitude of this contrast of convalescent atmospheres will be appreciated by industrial physicians, especially those in heavy industries.

We believe that medical care of all industrial burns should have as its objective the best possible anatomical, physiological and cosmetic results, irrespective of the time or cost involved. With an ambulatory burn case who is able to work, we wish to obtain such a result *while keeping him on his job*. Reduction of pain and discomfort of a burn to a minimum is mandatory if the man is to continue work. We desire to keep at a low level the days lost from work, for both the employee and the employer lose with each lost-time injury.

Considering the complex state of industry today, it is advantageous to reduce the time that an injured employee spends on work other than his regular job.

Plant Description

THE Rustless Division of the Armco Steel Corporation, manufactures stainless steel and has an average plant population of about 2,000 employees. The dispensary is located in the geographical center of the plant, and is staffed with one full-time and one part-time physician, one chief nurse, four rotating staff nurses, one x-ray and laboratory technician, a medical secretary and a medical clerk. We average about 20,000 patient visits for all causes to the dispensary in one year. We have about 3,000 new injuries annually, of which 18% to 20% are burns. Most of these are thermal and a few are chemical.

Sources of Burns

THERMAL burns arise from contact with red-hot bars or billets as they go through the multiple passes in rolling mills, or with ingots as they are forged into bars in the hammer shop. They may result from touching hot wire as it is pointed for a die, or as it goes through a die in the wire mill. Sparks from the grinding of ingots, blooms, billets, and sheet bars, occasionally produce burns. The charging, melting down and pouring of the molten steel from electric furnaces are common sources of burns. Maintenance employees sustain burns in various ways related to their particular crafts. Spark burns, although frequently small, are multiple and deep, and the subcutaneous tissue will usually be exposed. Burns from hot bars vary widely in extent and severity. They may be round, oval or linear in shape, depending upon the part of the body burned and the speed with which the bar is traveling through a pass.

Chemical burns are produced by contact with molten caustic, aqueous caustic bath, sulfuric acid or nitric acid in the anneal and pickle department, or in one of the three laboratories. Obviously, a burn caused by molten caustic is both chemical and thermal. Burns from chemicals vary in severity directly with the concentration of the material, and inversely according to the speed with which the chemical is washed off.

Types of Burns

DURING the 12-month period of Zinax treatment there were no burn cases serious enough to hospitalize. We had four employees who lost time because of burns. One of these had a facial burn which became quite painful when near the heat of an electric furnace, and he was unable to continue at his regular job. Another had a third degree burn, 2 in. x 2 in., over the knee joint and, since his work included considerable stooping, he was unable to continue at his regular job. The third case had three seared burns, one 4 in. in diameter, the second 2 in. x 3 in., and the third, 1 in. x 2 in., all on the lower legs. The fourth case had a ½ in. x 1 in. burn on the elbow, a 2 in. x 3 in. burn on the leg and a 2 in. x 2½ in. burn on the forearm. These

four cases lost a total of 49 days, averaging about 12 days per case.

About one-third of all of our burns were first degree and two-thirds were either second or third degree or combinations thereof. The third degree varied from ¼ in. in diameter to 10 to 12 square inches in area. The largest burn treated was about 4 in. x 6 in. Depending upon the patient's type of work and location of the burn on the body, we believe that about 10 to 12 square inches is the maximum size of a second or third degree burn with which the patient can continue at his regular work in a steel mill. All of the 581 cases were ambulatory and no skin grafting was done. The distribution of cases by type is shown in Table I in which we have also recorded 102 abrasions from physical forces, for we felt that the loss of skin in both burns and abrasions was a common factor and it was immaterial how the skin was lost. We have found that abrasions respond equally well to this treatment.

TABLE I.
TYPES OF CASES TREATED WITH ZINAX

Thermal Burns		535
Chemical Burns		
Molten Caustic	24	
Aqueous Caustic Solution	5	
Caustic—unspecified	4	
Lime (dry)	1	
Nitric Acid	6	
Sulphuric Acid	2	
Acid—unspecified	3	
Paint Solvent	1	46
Abrasions		102
Total		683

Comparison of Methods of Treatment

RESULTS of three years and 11 months of sterile petrolatum treatment were compared with 12 months of Zinax treatment. A total of 15,233 new injuries were cared for in our dispensary from January 1, 1947, to November 30, 1951. Of these, the 2,868 burn cases were segregated and individually reviewed. Since eye burns are treated with ophthalmic ointments only, 312 eye cases were removed from this analysis. The remaining 2,556 burn cases* were divided into two groups:

TABLE II.

Time	No. of Burn Cases	Treatment
3 yrs. and 11 mos. (From Jan. 1, 1947, to Nov. 30, 1950)	1,945	Usually sterile petrolatum gauze; occasionally an anesthetic or chlorophyll ointment
12 months (From Dec. 1, 1950, to Nov. 30, 1951	581	Zinax gel and gauze

Serious Minor Burns

THE ideal experimental method of comparing two types of treatment is to apply each type to separate halves of a burned area. This is impractical in industrial medicine for it suggests "experiment" and "guinea pig" to the injured employee. We felt that if this gel and gauze were to have industrial value, the time required for healing should be shortened and the end results improved. Otherwise, there was no reason to change from the routine use of sterile petrolatum. In cases of mild erythema where not more than several days of active treatment are given, it would be difficult to demonstrate the superiority of any therapy.

We considered that any minor burn which required active treatment for more than eight days would be a severe one and would include most second and all third degree lesions. By active treatment we mean Zinax or sterile petrolatum, or any other ointment. The end of active treatment was the first day that a dry sterile dressing was applied for mechanical protection. In Tables III and IV and in the accompanying discussion, serious minor burns are those sufficiently severe to require nine or more days of some treatment other than dry sterile dressing.

Comparison of Length of Treatment

TABLE III compares the length of time required for serious minor burn treatment with sterile petrolatum and with Zinax. The average number of days of treatment per burn with sterile petrolatum ranged from 17.2 to 18.5 with an over-all average of 18.0 for the approximate four-year period. The comparable figure for Zinax treatment was 14.0 days over a 12-month period. This represents a significant decrease in healing time for serious minor burns.

TABLE III.
COMPARISON OF LENGTH OF TREATMENT OF SERIOUS MINOR BURNS

	No. of Serious Minor Burns	Total Days of Treatment	Average No. of Days of Treatment per Burn
1947	71	1,285	18.1
1948	89	1,647	18.5
1949	38	692	18.2
1950 (Jan. 1-Nov. 30)	50	858	17.2
Average 1947, 1948, 1949 and 1950			18.0
1951 (Dec. 1, 1950-Nov. 30, 1951)	152	2,131	14.0

CASES EXCLUDED:

1947—Leg burn with marked varicose veins and poor circulation, 74 days of treatment.

1948—(1) Leg burn with marked varicose veins and poor circulation, 59 days of treatment.
(2) Bone charred, hospitalized, two fingers amputated, 50 days of treatment.

1950—13 days late reporting; burn markedly infected, 24 days of treatment.

1951—(1) Leg burn, patient stopped treatment and went to own doctor three weeks, returned with drug rash.
(2) Three days late reporting, massive infection of burn, 17 days of treatment.

Increased Severity of Minor Injuries During 1951

DURING 1951 there was an increase in the frequency and severity of minor injuries. Several factors contributed to this. Defense order requirements stepped up the production of steel and vacations were necessarily curtailed. The

*Note: 30 burn cases were excluded from the 1951 series: 18 were burns of the ear canal and mucous membranes of lips where Zinax could not be used; five were during transition period; seven were treated with several ointments.

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pressure of increased operations necessitated the use of new employees with little experience. During the summer months the weather was unusually hot and humid, with a resultant irritating effect upon the dispositions of employees, leading to less regard for safety precautions. During the summer months there was a high rate of absenteeism which required the use of less experienced employees to fill the vacant jobs.

It is well known in industrial safety circles that there is rarely a sharp break between the severity of minor and major injuries. When a rising severity of minor injuries is plotted on a graph it will be shown to mount gradually until a major or lost-time case occurs. Both the number and percentage of serious minor burns were greater in 1951 than in the four previous years. During the same period we had four lost-time burn cases which was more than all of such cases during the four previous years. This means that the testing of Zinax burn therapy was actually more rigid than the figures indicate, yet, there was an average decrease of four days in treating a burn with this material. This increased severity of minor burns is given in Table IV, where the percentage of serious minor burns is calculated for each of the five years.

TABLE IV.
INCREASED SEVERITY OF MINOR BURNS DURING 1951

	1947	1948	1949	1950 (1/1/50-11/30/50)	1951 (12/1/50-11/30/50)
Total Burns Treated	498	756	227	464	581
Total Serious Minor Burns	71	89	38	50	152
Percent Serious of Total Minor Burns	14.3%	11.8%	16.7%	10.8%	26.1%

NOTE: 1948 was a year of expanding production: many new employees were hired and the frequency of all accidents increased.
1949 was a year of declining production: seven weeks were lost by the steel strike, and the accident frequency was low.

Comment

REDRESSINGS: There is less time spent on redressings, for the basic dressing of gel and zinc acetate gauze is left intact rather than being changed daily as was the case with sterile petrolatum gauze. Such time-saving benefits both the injured employee and the dispensary staff. The basic dressing is covered with an outer dressing of plain sterile gauze and held in place by adhesive tape, roller bandage, or Steritube®, depending upon the anatomical location of the burn, to protect the basic dressing from grease, dirt, etc. A much shorter time is required to change such an outer dressing than to replace sterile petrolatum gauze, especially if it has dried and must be carefully soaked loose. There is no difference in the time required for the original application of the gel treatment when compared with sterile petrolatum treatment.

Occasionally, a basic dressing will have to be changed after a man takes a shower, for the gel and film are water-soluble. However, we try to keep such replacement at a minimum, for we have found that even though the basic dressing appears to be completely loose, some part is usually stuck fast and is painful to pull loose or requires time to soak loose.

OOZING: Occasionally, in a third degree burn, there will be an area of oozing through the basic dressing. We believe that this oozing is due to the localized proteolytic and phagocytic action on dead tissue. If the dressing is removed from such spots the tissues do not appear to be infected nor are they more inflamed than adjacent areas of the burn. Spangler[3] has made cultures and smears of such exudate and states that he usually fails to find organisms. If the area of oozing is small, the basic dressing is left intact. If a considerable area of the dressing has oozed through, then that part of the basic dressing is excised and fresh gel and gauze applied. Occasionally, where a burn has appeared originally to be a second degree, we will find an area of such oozing and from experience we have learned to identify this as a site of third degree damage.

DECREASE IN SCAR TISSUE FORMATION: On all of the third degree burns treated, we have been impressed with the decrease in white, fibrous scar tissue formation. These lesions have healed from the periphery inward without the rolled-up, indurated edge which we saw so commonly with sterile petrolatum gauze. Rarely did we have a case in which viable islands of epithelium remained in the central portion of the burn and thereby aided regeneration. We feel that the rate of epithelization has been much more rapid with this treatment than with our former method of using sterile petrolatum gauze. We have found that the epithelium regenerated on a third degree burn is at first a pink which slowly changes to resemble the natural pigmentation of the adjacent skin.

PROPER APPLICATION OF GEL: Within a few minutes after application of the gel and gauze to a burn, there may be a transient, mild stinging, possibly associated with the warmth of the dressing as the film sets. This temporary effect lasts several minutes and rarely troubles the patient.

However, during the summer of 1951, when we encountered a large number of serious minor burns as well as the four lost-time burn cases described above, we had complaints from some patients of a marked burning occurring immediately or shortly after the dressing was applied. From the onset of this regimen, the gel had been applied either to the wound or to the gauze and then to the wound. Investigation of all of the factors involved in this treatment revealed that the trouble lay in placing the gel on the burn rather than on the gauze. In many cases the surface of the burn was smooth, shiny and slippery and the gel would slide easily from one part of the burn to another, leaving some spots exposed. When con-

tact was made between such spots and the gauze, impregnated with zinc acetate, the latter produced the burning. This difficulty was solved by applying the gel to the gauze so that it becomes incorporated in the mesh of the gauze over the entire burn. We have not been troubled with complaints of burn when this technique is employed.

Early in the study we had some complaints of a sensation of pulling or tightness, particularly on the periphery of the burn. It was found that in these cases the gel and gauze had extended about to the periphery of erythema and then when the film set and became adherent, any motion of the underlying tissue resulted in a pulling on skin which had suffered a first degree burn. Again, this was solved by extending the dressing from ¼ in. to ½ in. beyond the periphery of erythema of all burns. We have encountered no cases of allergic sensitivity to this treatment.

PERIOD OF SLOUGHING: With our third degree burns, the seared area sloughs free in about five to seven days. During and for one day following sloughing, the burn is at its most tender state. Following this, we have noted repeatedly that although there is no visible change in the slough-free portion, tenderness has disappeared.

BLISTERS: Unless a blister has developed by the time the employee has reached the dispensary, it is exceedingly rare to have one develop with this treatment. This is in marked contrast to the situation prevailing with sterile petrolatum treatment. It is probable that the mild splinting and local pressure action of the pliable film is responsible.

Cases

ACCOUNTS of two of our 581 cases are given. The first reported for immediate treatment, while the second delayed reporting for three days and had a severely infected burn.

1. An electrician working on a fuse box had his hands in front of his face when an electrical explosion occurred producing first, second and third degree burns on the volar and dorsal surfaces of both hands from the fingertips to the wrists. The hair and eyebrows were singed and there was mild erythema of the face, but the position of his hands saved his face from serious injury. When brought to the dispensary he was in considerable pain and he was immediately given Demerol® by intramuscular injection. Loose skin was removed and all of both hands, from fingertips to wrists, were dressed with gel and gauze. Within several minutes after the dressing had been applied his pain decreased markedly. The time interval was too short to be accounted for by the Demerol injection. As it happened, he was not scheduled to work for the next two days, but since we had dressed the fingers separately, in glove fashion, he felt that he could have done most of his work at handling pliers, screwdriver, etc., as there was very little tenderness on palpating the fingers through the dressing on the following day. Some seepage occurred on one third degree area covering about three square inches surrounding the base of the right thumb, and this localized spot was redressed. The man progressed well, and 18 days from date of injury epithelization was complete over all areas without evidence of scar tissue. For the following week he wore a dry sterile dressing as mechanical protection to the newly formed skin.

2. A grinder delayed reporting a burn on his foot until three days after injury. When first seen he had an ulceration ¾ in. wide and 2½ in. long, extending down to the subcutaneous fat. This was grossly infected with free pus and there was sloughing over the entire wound. There was marked lymphangitis of the leg and an enlarged, tender, femoral node, one inch in diameter. He was given injections of penicillin, hot soaks, and the wound was debrided and an antibiotic ointment applied. At the end of about one week the wound was the same size but appeared to be clean and not infected. The exposed subcutaneous tissue was as noted above, about ¾ in. wide and about 2½ in. long. At this time the gel and zinc acetate were applied. This dressing had to be changed twice because of serous drainage (possibly some of the drainage was due to the subsiding infection), and at each of these redressings the epithelium could be seen to be growing in from the edges. There were no islands of epithelium left in the center and there was no red, hard induration at the edge of the wound. Seventeen days after injury the wound was completely epithelialized and needed only a dry, sterile dressing for a few days.

Summary

THE theory and use of partially hydrolyzed casein and zinc acetate impregnated gauze in the local treatment of burns is described. The use of this material known as Zinax gel and gauze was instituted in a steel mill dispensary after the method was found to have merit in the treatment of non-industrial burns.

Comparative results in a total of 2,526 thermal and chemical burns over a period of four years and 11 months are presented. Of these, 1,945 cases occurring during a period of three years and 11 months were treated with sterile petrolatum gauze or occasionally an anesthetic or chlorophyll ointment, and 581 cases occurring during a 12-month period were treated with partially hydrolyzed casein and zinc acetate impregnated gauze.

With serious minor burns, the average number of days of treatment was reduced by over 20%. In the sterile petrolatum series the average days of treatment was 18.0, whereas in the Zinax series it was 14.0 days.

The number of redressings was decreased to one-half to two-thirds of that under sterile petrolatum regimen.

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The time required for each dressing after the first was reduced.

Better results were obtained with less scarring.

With proper application of the gel and gauze, patients were comfortable during treatment. Each has continued on his regular job with the exception of the four lost-time cases.

Conclusions

1. WE BELIEVE this treatment has worked as well with minor burns as described for major burns.[2,3]

2. We believe it represents a superior method for the treatment of the ambulatory industrial burn.

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Respect for the Physical Factors

BY WAY of an interesting, probably not easily delineable psychosocial trend, the physicist's thesis of a non-static universe seems to parallel or be related to the psychiatric and psychosomatic belief in the essential power and influence of the emotional or mental components in human life. It is true and well known that some of the East Indian yogis have such control over the body that they can alter autonomic functions and even dissociate pain from consciousness. Admitting freely the importance of the mind and the psychic side of emotions, man will be sadly misled if he decides that he can successfully and healthily ignore what he has naively thought of as his physical structure. There are no authenticated reports of anyone's walking through a table instead of walking around it, jumping over it, crawling under it or moving the table itself to get on the other side. Up to the present, falling from a tall building to a hard surface beneath, being run over by a locomotive, or being hit squarely by an automobile going at 60 miles an hour results in unmistakable alterations in the physical structure of the body, if one can at all believe his senses. The psychosomaticist may reply, with contumely, that he makes no assertion whatever that the body cannot be injured—that his interest lies in the *cause* of injury. But undue emphasis of this interest may deter or interfere with the best treatment or may aggravate the injury. It is not exaggeration to state that some patients have been poorly treated and subjected to unnecessary expense because of the current stress on the "psycho" part of psychosomatic treatment. Considerable mental distress can be induced if a patient is made to believe that his physical illness is due to unresolved emotional conflicts or chronic emotional or personality maladjustment. Even if some persons have a proneness to accidents, there is still a place for public safety laws in community life, and although a person may have diarrhea of emotional origin it is also possible that he may have amebic dysentery. An all-or-none principle is not compatible with the best medical discipline, and the psychosomaticist should have respect for physical factors as possibly primary, not as effect only. One should not try to walk through tables until atomic fission is complete.

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The Industrial Health Team

HE TRAVELS fastest who travels alone." That aphorism, like most others, expresses only a half truth. Clearly the industrial physician travels only slowly toward achievement when he elects aloofness from those other individuals and industrial services likewise dedicated to conservation of the worker's total physical and mental well-being. Every person in industrial employment influences to some degree the well-being of one or more workers about him. More importantly, in addition to the industrial physician, inevitably there are other persons serving the workers on a professional basis who unfailingly influence the health of the entire plant force.

Potentially, a health team always exists, but the actuality of the team and the team work is by no means certain. The members of the desired team are the physician, the nurse, the industrial hygienist, the safety engineer, the employment manager; in varying degree all function to a common objective—worker conservation and development. The ingredients for a team nearly always are around, but rare is the team.

No issue is raised that the physician should command the team, but the leadership of it is a different matter. The physician's leadership should be both professional and personal. A company of lions commanded by a goat becomes a company of goats. A company of goats commanded by a lion becomes a company of lions. Or, for a pure translation of the old Roman proverb: "An army of stags led by a lion would be better than an army of lions led by a stag." Since the apex of the team's work unequivocally is medical, the industrial physician, to be effective, cannot escape the responsibilities of team leadership.

The physician continually may give lip service to this matter of continuing betterment in human relations, but day by day create havoc by lack of proper human relations right in his own office. One capable, but bitter, industrial nurse complained, "I have been here eight years. My medical director on the same floor doesn't even know my name, and wouldn't recognize me out of uniform." This same director might not know the name of the safety director except on referral to the plant phone book, and to this same physician, the fact that the employment manager's wife wrecked the family car, sadistically is but a good joke on that manager. The industrial physician's human relations program is never better than those relations he creates in his own department and within the professional team.

AT this period, when the need for team action is more than ever apparent, the disposition among the team segments is toward resentful apartness. The industrial hygienist, in prideful professional growth, is building scornful class walls. The nurse, industrial and otherwise, frets endlessly that she is in a captive profession and seeks release and new professional worlds attended by fewer restraints. The safety engineer knows full well that a limit approaches in his usefulness only in terms of guards, goggles, and inspections. The employment manager—but why

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iterate? Philosophy has been defined as profound research into the obvious. The desirability of team work in industrial health requires no profound philosophy or any change in philosophy. The situation is irrefutable.

In a past not far removed, all the mentioned team members functioned in divergent worlds. This state represented fallibility. The physician then chiefly was concerned in the worker's wounds and not the worker. The safety engineer in that period focused his ministrations upon machines and not upon the workers who operated them. Some nurses applied themselves to precise records rather than the individual whose name appeared at the top of the sheet. The industrial hygienist—but again the iteration. Now as a product of the slow gropings of progress, one and all have made an illuminating discovery. Overwhelmingly the objective of industrial health is the worker himself—the whole man. Upon him all personnel services ultimately converge.

There is no tenability in the concept of an exploding universe in the services devised for the conservation of the industrial worker. Convergence is the word—the pooling of objectives and plans—the integration of ministrations—the team.

Stones of Memory

WIDE is the belief that the age of discovery is over. Only once could the Half Moon sail up the Hudson. Only once could the South Pole be seen for the first time. Only once could the first wireless impulse be received across the Atlantic. But the age of discovery has not yet gone, nor will it ever be gone. It is given each man, each woman, each child to discover, as an individual, personal experience, the marvels that attend life. On a fine day, anyone may hear, newly for himself, that scarcely imitable sound made by stalking through the freshly-fallen crisp leaves of autumn. Anyone may discover the breath-taking early morning beauty of dewdrops on ripening grapes. It is no small experience to see for the first time the stark white purity of an open coconut, or the blue and yellow curling flames of a wood fire. The sudden coming upon an unexpected woodsy patch of springtime bluebells, if this be a new happening, provides a gasp of discovery perhaps not unlike that of DeSoto when first he saw the Mississippi, or "stout Cortez, when, with eagle eyes, he stared at the Pacific," or Keats, himself, on first looking into Chapman's Homer. Long remembered should be the gentleness with which, for the first time, a baby hand wraps around more sturdy fingers. Such things in endless variation, provide a wealth of discovery. Every man to his own opportunities. He will find them rich and rewarding in such degree as he holds them important. They are things he *may* remember. Along with them come other discoveries of the kind he *must* remember, the inevitable accompaniments of living—success, failure, friends, enemies, new work, new scenes, age, sickness, death .... As subjective discoveries of his own, or objective discoveries thrust upon him, each will ask of him: "Are we to mark this day with a white or a black stone?" And from them he will compile his own "calendar of days"—his record of anniversaries—his "almanac." No life is lived without one. What is a "Who's Who" but a collection of personal almanacs?

AS with individuals, so with their organized activities. Each nation, each state, each profession, each enterprise has its history. Our interest now is in the history of the profession of industrial medicine as it can be developed in almanac form. Both the subjective and the objective are important—the discoveries made by its people, and the events that happened to it and its people. Both are involved; they are inextricably woven together. Who discovered berylliosis, and when? Who coined the term "silicosis"? Perhaps, who first made a dust count? Who first associated urinary porphyrins with lead poisoning? Who made the finding that hydrogen sulphite readily passes through the intact skin? Who? What? When?—all things of the kind, as to the day thereof. In the effort to present a mosaic of industrial medical history, DR. LEGGE'S ALMANAC, complete with half moons and signs of the zodiac, will occupy page 14 throughout this year, and, we hope, through many succeeding years. If, in its interpolated notations of life spans begun or ended, the brief items should be considered "stones of memory," let it be believed that those stones are markers along the path to Industrial Medicine's Hall of Fame.

NEWS, COMMENT, OPINION

BLOOD donated by Lilly employees is the first being processed by the new plant operated by Eli Lilly and Company in Indianapolis for the production of dried human blood plasma. This plant, operated for the U.S. Government, is housed in a five-story structure, the interior of which resembles a modern hospital, having green asphalt-tile floors, green glazed-tile walls, glass-brick windows, and stainless-steel equipment.

Survey

THE American Medical Association's Council on Industrial Health is making a survey of the number of physicians in defense areas for the purpose of encouraging physicians to settle in any such areas found to be short of medical personnel.

Oh, Oh!

IT IS reported in Chicago that at the last examination for applicants for medical license given by the Board of Registration and Education of the State of Illinois, the Board called each applicant in for a five-minute interview, and among the questions asked was the following: "What have you been doing previous to this examination?" Some 40 applicants are said to have replied: "I have been working in Dr. X's office. He is an industrial surgeon."

Amputee Conference

THE Sixth Annual Amputee Conference will be held at the Kessler Institute for Rehabilitation, Pleasant Valley Way, West Orange, New Jersey, May 1-3, 1952. The Conference will discuss the problems of upper and lower extremity amputees. The subjects will include psychological preparation of the patient, surgery for upper and lower extremity amputations, after-care of the stump, and general conditioning, prostheses, and training of the amputee.

Bamboo

BENCEL L. SCHIFF *(A.M.A. Archives of Dermatology and Syphilology*, July, 1951) states that he recently was called to investigate an outbreak of dermatitis in a factory that manufactured tennis rackets made of bamboo. The bamboo used was in long strips, devoid of bark and hair, and prior to being molded into shape it was put through a sanding process. A check of dermatological literature revealed no reports of any dermatitis from bamboo. Three cases of contact dermatitis due to bamboo, with positive patch test reactions, are reported. The dermatitis involved the exposed parts and was very pruritic. On healing of the dermatitis, a deep brownish pigmentation was noted on all parts involved.

—Urologic & Cutaneous Rev., December, 1951.

Small-Plant Medical Program

AN ADEQUATE small plant medical program calls for a physician and nurse who are part-time in the plant. W. R. BOND (in *Factory Mgmt. & Mtce.*, 109:123 (September) 1951) presents the essentials of a program, the scope of medical service, and advice on

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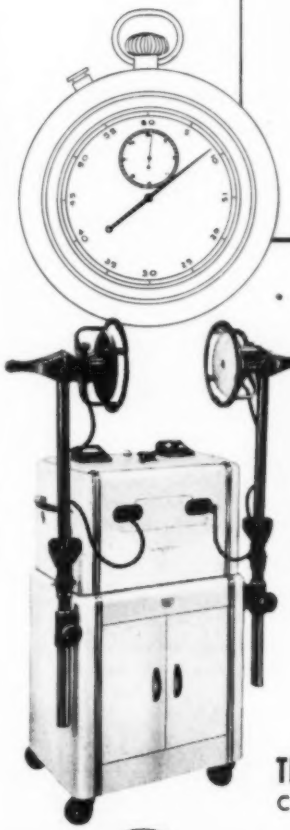

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establishing the service, with quotations from several experts and examples of successful programs. An initial investment of $1000 and expenditure of $10 to $17 annually per employee are sufficient to provide the basic essentials. The space requirement need be only 200 square feet with economical arrangement of facilities.

—From *Industrial Hygiene Digest*, 15:12, 40 (December) 1951.

Old-Age Counseling

OLD-AGE counseling for retiring employees has been installed by Lockheed Aircraft Corporation. Ray H. Griest, a retired executive, heads the program. Later he'll get a financial expert and physician as aides. The plan was put together by Karl Kunze, Lockheed psychologist.

—*Notes and Quotes*, Connecticut General, January, 1952.

All From Taxes

ONE may be inclined to argue that Social Security payments will largely take care of the support of those over 65. When we consider that the funds contributed by wage earner and employer under Social Security consist of merely stacks of nonnegotiable but interest-bearing government bonds in the Treasury Department and that when claims exceed current contributions they will be paid out of general tax revenues, the seriousness of the future tax situation becomes apparent.

—From "Taxes and Our Changing Age Distribution," Editorial, *Minnesota Medicine*, 34:12, 1185 (December) 1951.

Workmanicure

ONCE a week 100 men in a large British factory queue up for a manicure, London reports. Two girls hired by the firm cut and file their nails and smooth out callouses. The men make nylons and the tiniest piece of jagged nail or rough skin may ruin dozens of pairs by starting "ladders" or runs.

—*New Orleans Times Picayune*, December 26, 1951.

Doses of Recreation

REGULAR doses of recreation are vitamins to build the good life, Professor Marvin Rife, of the University of Wisconsin, points out in the lead article in the current issue of *Health*, the bulletin published by the Wisconsin State Board of Health. "Modern man has many hours of earned leisure —yet he is generally physically unfit, mentally confused, emotionally frustrated, and socially unadjusted," he says. PROFESSOR RIFE prescribes six basic ingredients which are to be used daily in the cure of these evils: physical exercise, social interaction, solitary relaxation, creative expression, intellectual stimulation, and spectator appreciation.

—University of Wisconsin News Service

Policy Guide

A SHORT report prepared by the Industrial Nurses Section of the Pennsylvania SNA lists 10 statements of policy to serve as a guide to the nurse and management in providing working relationships which are basic to a sound health program. A compact industrial nursing bibliography is included. Write to PSNA, 2515 North Front Street, Harrisburg, for a copy.

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Noise

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—SYDNEY J. HARRIS, in *Chicago Daily News.*

Why Bald

NEW clues to the possible causes of baldness have been discovered in medical research laboratories of the University of Pennsylvania. According to observers who were doing basic research on the skin related to cancer, they stumbled, virtually by accident, upon a chain of developments which tend to indicate that oil secreted by the human skin—the semi-fluid substance known as sebum—may exert a controlling effect upon natural hair growth and constitute a leading causative agent in bringing about eventual baldness.

—*Philadelphia Medicine,* quoted in *Digest of Treatment,* December, 1951.

Hygiene and Science

IN 1936 the American Association for the Advancement of Science provided for a section on Industrial Science, but the projected section did not materialize. In 1950 the AMERICAN INDUSTRIAL HYGIENE ASSOCIATION became affiliated with the AAAS, and its officers asked for a separate section to encompass the field interests of that group. The Executive Council of the AAAS decided in April, 1951, to establish a section on industrial science, known as Section P, with the Industrial Hygiene group as a nucleus. The new section held its first meeting in Philadelphia December 28 to 30, 1951, as part of the general meeting of the AAAS. The meeting began with an address by PRESIDENT WEIDLEIN, of Mellon Institute, and continued through the three days of the general meeting, with papers on various aspects of industrial science. The program for the Friday afternoon session (December 28) was presented by the AIHA, with MR. FLETCHER, Chairman of the Board of Trustees of Industrial Hygiene Foundation, presiding. The papers given were: "The Impact of Industrial Hygiene on Industrial Science," by T. F. HATCH; "Contributions of Applied Toxicology to Industrial Hygiene," by H. F. SMYTH, JR.; "The Increasing Importance of Physical Agents in Industrial Hygiene," by J. H. STERNER, M.D.; and "The Scientific Control of Industrial Health Programs," by A. D. BRANDT, Chairman of the Section. The meeting place was the Ballroom, Hotel Sylvania.

—From *Industrial Hygiene Digest,* 15:12 (December) 1951.

"Formula for Freedom"

MICHIGAN State Medical Society, at its 86th annual convention, adopted a program called "Formula for Freedom."

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The Detroit Times, commenting on the program in a laudatory vein, said that "the fact is made clear that the medical society will confine itself to urging its members to vote—no matter how they might choose to ballot—and to urging true knowledge and understanding of government. The society will continue to oppose the crack-brain plans of socialistic schemers, not as partisan politicians, but as good doctors .... Spokesmen of the medical society have made their position exceedingly plain."

—*Wisconsin Med. J.*, December, 1951.

Communist Economics

IN SIX years in the orient this reporter has read nothing more suggestive than this excerpt from a Chinese communist course in "basic economics": "In the United States there is one auto for every eight persons. If we bring down this average, which is maintained at the expense of the Chinese and colonial peoples, then there will be more cars for us Chinese. If we could bring down the American standard to one auto for each 16 persons, then there would be enough for China to have one car for each 16 persons." This thought should be pasted in every American's hat, for it represents the avowed objective, not only of our communist enemies, but of our foreign friends as well.

—WALTER SIMMONS, in a Book Review, *Chicago Tribune*, December 9, 1951.

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The Issue

THE issue in 1952 will not turn on Republican versus Democrat. The basic challenge to all Americans, regardless of party, is whether they are ready to rid themselves of the deep freeze, mink-coat, tax-fixing gang in Washington and replace them with men who believe that public office is a public trust and not a private hog trough.

—JOHN S. KNIGHT, in *Chicago Daily News*, December 1, 1951.

Ready in Detroit

INDUSTRIAL MEDICINE in Detroit is awake to the problem of medical care after atomic bombing. It has supplied necessary information as to personnel, facilities and supplies. It has accepted assignments. It is stockpiling some basic supplies. Its medical personnel is studying the latest methods in the care of injuries and burns peculiar to atomic bombs. In varying degree industry has in effect programs for giving first aid training to certain groups of employees; key personnel have been advised of plans for expansion of medical departments and their duties established; plans for quick conversion of vehicles to ambulances have been prepared; some plants have arranged for typing the blood of employees. Its efficiency and final contribution will be measured in large part, however, by the amount of help it receives from management in organizing for sudden expansion, and in having available

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the services of auxiliary plant personnel, properly informed and instructed in their assignments, when the day comes. To summarize the contribution which the medical services of industry can make to civil defense: Industrial medicine is already there, on the job; it is staffed and functioning in 200 locations; it is a going concern. It is widely distributed. It is manned by staffs accustomed to emergencies. It has supplies and facilities. Finally, it is a part of thoroughly-organized closely-knit industrial organizations having the ability and personnel to cope with situations. It is this association with the manufacturing organization of industry which gives industrial medicine its greatest potential in atomic disaster.

—From "Industrial Medical Services in Civil Defense," by A. F. LECKLIDER, M.D., Chief, Industrial Medical Aid Section, Civil Defense, in *The Detroiter*, October 22, 1951.

In Utah

TO GUIDE County Societies in establishing workable rules, the Committee on Industrial Health of the State Medical Society suggests the adoption of the following principles: (1) *Pre-Employment Examinations:* Assuming that the employer has the right to designate the physicians who will conduct examinations within his plant, efforts should be made by the County Committee on Industrial Health to provide wide participation in the program. Acceptable medical practice would dictate the wisdom of: (a) Making available to the family physician of the examinee a full report of the

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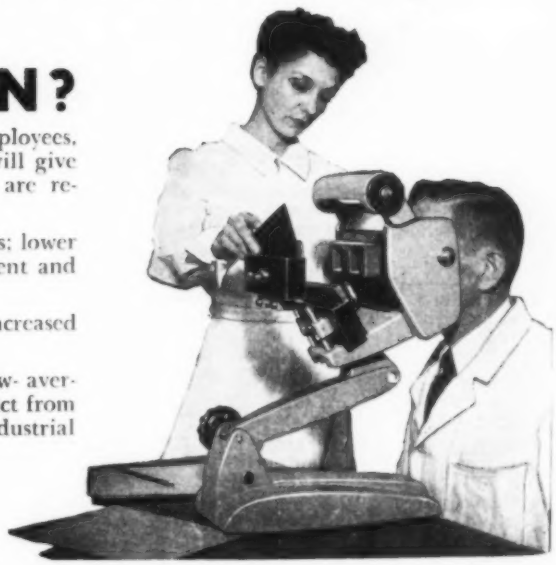

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examination, if the examinee indicates a wish that the report be transmitted to a physician of his choice. (b) Willing consultation with the examinee's personal physician when differences of opinion arise regarding medical findings. (c) Refraining at all times from directing the examinee to any one practitioner to whom the examinee should report for correction of defects discovered in the examination. Free choice should be adhered to in practice as well as in principle. (2) *Occupational Diseases and Injuries:* The following rules of conduct should be adhered to in the interests of sound medical practice: (a) It is not ethical for an industrial surgeon, while caring for an industrial injury or disease, to urge the patient to have a concomitant and coincidental disease treated by himself at the worker's expense. (b) Once a case of questionable liability to the employer is diagnosed as being of a non-occupational origin, the patient is to be referred to his personal physician for further care. (c) A physician or surgeon is not to use his industry affiliation as a direct means of gaining a private practice among plant workers. This includes solicitation, low fee arrangements, and insinuation of reprisals against workers who insist on care by physicians of their choice. (3) *Obligations of Non-Industrial Physicians:* While the above rules directly apply to physicians engaged in industrial practice, there are like obligations of those who serve as non-industrial physicians coming in contact with cases involving industrial care. (a) If a private physician suspects the diagnosis of an occupational disease or illness, he should, with the patient's permission, communicate the information to proper plant medical authorities. (b) If differences of opinion exist as to the compensability of medical and surgical conditions, the private physician, with the permission of the patient, should confer with the plant doctor. (c) Statements to workers that treatments offered through the plant physician are not in keeping with sound medical practice (in the opinion of the examining physician) accomplish nothing constructive and should be withheld until there has been a consultation with the plant physician to ascertain all the pertinent facts.

—*Rocky Mountain Med. J.*, November, 1951.

Not Age Alone

THE HIGHER mortality rate from acute myocardial infarction in older age groups is due to a greater frequency of serious attacks rather than to the age of the victims, it was stated in December 29, *J.A.M.A.* Acute myocardial infarction, a common, serious heart condition, is the degeneration of the heart muscle due to the obstruction of a coronary artery. Five doctors pointed out that although severe attacks are commoner in older persons, the prognosis of a severe or mild attack appears to be unaltered by age. "The pessimism commonly revealed in the estimation of prognosis in any elderly patient with this disease is unwarranted if based on age alone," it was stated. "Too often the persistence of such pessimism, even after satisfactory recovery, has condemned the elderly good risk survivor to a non-productive, boring existence. Patients in this

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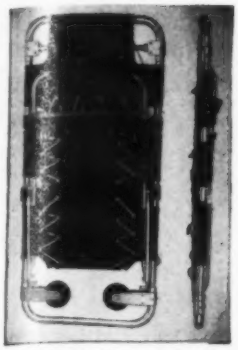

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category, as well as those in younger groups, may be successfully rehabilitated toward regaining a measure of personal, social, and economic independence consistent with their residual capacity." The doctors based their conclusions on a study of 1,047 persons suffering from acute myocardial infarction, 843 of whom were men, and 204 women. The age range was 30 to 88 years, with the mean age of the men 56 years, and the women 60 years.

—*A.M.A. News Release*, December 28, 1951.

In Wisconsin

CONTINUING the program of clinics this past year, the Committee on Industrial Health sponsored three meetings, each judged successful from the comments of those in attendance. Clinic sites were at the Marathon Paper Corporation mill in Menasha, the Allis-Chalmers plant in West Allis, and the Manitowoc Shipyards, and Aluminum Goods Manufacturing Company in Manitowoc. A total of 258 physicians, 126 industrial nurses, and 183 representatives of management, a grand total of 567 participants, took part in the three meetings held this past year. In each instance the clinics included scientific programs, presenting a variety of topics of interest to physicians and nurses. At Menasha, H. O. MCPHEETERS, M.D., Minneapolis, discussed "Varicose Veins and Their Association to Industrial Disabilities," while C. C. SCHNEIDER, M.D., Milwaukee, MR. JOHN A. KLUWIN, an attorney from Milwaukee, and MR. HARRY NELSON, of the Industrial Commission, presented an informative discussion on "Pitfalls in Medical Testimony"; at Milwaukee "Visual Testing" was discussed by ARTHUR K. PETERSON, M.D., Chicago, and JOHN HITZ, M.D., Milwaukee; "Pneumoconiosis of Foundry Workers" was presented by L. E. HAMLIN, M.D., and MR. H. J. WEBER, Chicago, while MR. HARRY NELSON, Madison, discussed "Changes in the Workmen's Compensation Act"; and at Manitowoc, HARVEY S. ALLEN, M.D., Chicago, presented a paper on "Treatment of Thermal Burns," JAMES K. STACK, M.D., Chicago, discussed "Back Sprains and Strains," and M. J. MUSSER, M.D., Madison, spoke on "Emergency Treatment of Patients in Atomic Attack." This past year the Committee on Industrial Health, has made available to all industrial plants a monthly health news service. The material is widely used by industrial nurses, safety engineers, and others, through posting on plant bulletin boards and publication in industrial house organs. The response to this service has been dramatic, with over 300 Wisconsin plants now using the service, and others being added each month.

—From the Report of the Committee on Industrial Health, D. E. DORCHESTER, M.D., Chairman, in *Wisconsin Med. J.*, December, 1951.

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Rehabilitation Centers

DR. H. WORLEY KENDELL, Medical Director of Peoria's Institute of Physical Medicine and Rehabilitation, told the annual meeting of the National Safety Council in Chicago, that the concept of rehabilitation centers for disabled individuals will probably be eventually accepted by all major industrial communities in the nation. "Such centers already exist in a number of cities of various sizes," DR. KENDELL said, pointing out that Bellevue Center in New York is at one end of the range while the Peoria Institute is at the other. These vary in size and scope, but they all have one objective in common: "to bring into effective focus ir the individual who needs them the various services —medical, psychological, educational, and social—both from a preventive and a curative standpoint, so that he may retain or regain his position as an adjusted, contributing member of the community." He declared that there is a close relationship between physical medicine and rehabilitation and industrial safety, environmental medicine, and personal problems. The center "might serve as the community hub of all research, teaching and public education relating to these special fields." He deplored the slow rate at which centers were being set up in this nation, saying "Everybody is in favor of rehabilitation, but there is no sense of urgency about it.... the need for effective manpower in the light of the world situation hardly justifies this complacency." He traced the establishment of Peoria's Institute of Physical Medicine as representing a new development of medical activity, stemming from the organization known as the Peoria Plan for Human Rehabilitation which, as World War II came to its end, was set up under the guidance of Caterpillar Tractor Company, and was directed by its Medical Director, DR. HAROLD A. VONACHEN.

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